Universidade de Aveiro Departamento de Economia, Gestão e Engenharia Industrial
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ANA SOFIA DA SILVA NEVES

INOVAÇÃO E COMPETITIVIDADE INTERNACIONAL: EMPRESAS PORTUGUESAS VERSUS EMPRESAS LETÃS

INNOVATION AND INTERNATIONAL COMPETITIVENESS: PORTUGUESE COMPANIES VERSUS LATVIAN COMPANIES

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Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Economia – ramo Empresa, realizada sob a orientação científica da Doutora Elisabeth Pereira, Professora Auxiliar do Departamento de Economia, Gestão e Engenharia Industrial da Universidade de Aveiro e do Doutor Jānis Priede, Professor Associado da Faculdade de Economia e Gestão da Lātvijas Universitāte, Riga, Letónia.

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agradecimentos

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palavras-chave

inovação, competitividade internacional, internacionalização, shift-share, Portugal, Letónia

resumo

A estratégia Europeia 2020 contempla a inovação nos seus principais objetivos para catalisar o progresso no sentido de construir uma economia Europeia mais competitiva e sustentável. Com base no pressuposto da contribuição da inovação para a competitividade, o presente trabalho investiga a relação entre inovação e competitividade internacional, em duas pequenas economias europeias, Portugal e Letónia. Há evidência de que as pequenas economias se caracterizam por uma maior abertura comercial e uma maior competitividade internacional. Para melhor compreender a relação entre inovação e competitividade internacional, no âmbito das duas pequenas economias em estudo, é realizada uma análise comparativa dos dois países e aplicada uma análise estatística e sectorial, com uma análise shift-share. Mesmo sob condições económicas adversas, a inovação ocorreu em ambos os países. Os resultados mostram que a competitividade internacional Portuguesa está relacionada com as despesas em I&D e com o número de patentes, enquanto que a posição internacional competitiva da Letónia é apenas evidenciada pelas despesas em I&D. O sector português mais competitivo internacionalmente é o sector dos outros produtos manufaturados e na Letónia são os sectores alimentar, de bebidas e tabaco. Ambos os países evidenciaram um potencial de competitividade internacional no sector de transporte e equipamento de maquinaria.

keywords

innovation, international competitiveness, internationalization, shift-share analysis, Portugal, Latvia

abstract

The European strategy for 2020 considers the innovation as one of the main features to boost the progress towards a competitive and sustainable European economy. Assuming that innovation contributes for competitiveness, the current work intends to focus on the relation between innovation and international competitiveness of two European small economies, namely Portugal and Latvia. There is evidence that small economies are characterized by higher trade liberalization and higher international competitiveness. To better understand the relation amongst innovation and international competitiveness, within the scope of the two small economies under study, it's performed a comparative analysis between both countries and employed a statistical and sectorial analysis, with a shift-share analysis. Even under harsh economic conditions, innovation occurred in both countries. The results show that the international competitiveness of Portugal is related with its expenditures on R&D and patent applications while the Latvian international competitiveness is evidenced only with expenditures on R&D. The most internationally competitive sector of is the other manufactured goods and in Latvia is the food, drinks and tobacco sectors. Both countries show evidence of international competitiveness' potential in the sector of transport and machinery equipment.

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Acronyms

CE	Competitive Effect
CEE	Central and Eastern Europe
EC	European Commission
EEC	Eastern European Countries
EPO	European Patent Office
EU	European Union
FDI	Foreign Direct Investment
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on Research and Development
H-O	Heckscher and Ohlin
IE	Interactive Effect
IMD	International Institute for Management Development
IME	Industrial Mix Effect
IUS	Innovation Union Scoreboard
LV	Latvia
MNE	Multinational Enterprise
NIS	National Innovation System
OECD	Organization for Economic Cooperation and Development
OLI	Ownership Location Internalisation
PT	Portugal
R&D	Research and Development
RBV	Resource-Based View
SE	Share Effect
SITC	Standard Industrial Trade Classification
SME	Small and Medium Enterprise
UK	United Kingdom
UN	United Nations
UNIDO	United Nations Industrial Development Organization
VAT	Value-added Tax

1. Introduction

Economics explains how people interact within markets to get what they want or accomplish certain goals. Since economics is a driving force of human interaction, studying it often reveals why people and governments behave in particular ways. In Europe, 28 countries[1] aggregate the European Union (EU) by now and more are expected to come in[2].

The EU wants to become by 2020 a sustainable and competitive economy through its five ambitious goals around employment, research and development, education, social inclusion and climate/energy. The larger economies in EU may play the bigger role in it but that doesn't mean that the smallest ones are lesser important, since all countries participate in built-in policies towards competitiveness's flatness among EU's members, and thus, studying the position of the small economies in EU seems pertinent.

According to Filippetti, Frenz and Ietto-Gillies (2011), there is evidence that small economies are the ones with higher rank on internationalization, and Priede and Pereira (2013) state that internationalization is influenced by innovation. Moreover, innovation is also crucial for the public policy since it remains of the fundamentals of nations' competitiveness (Archibugi & Michie, 1998).

Portugal and Latvia are both small and open economies (Sousa, 2014; European Commission, 2008) and there are no direct comparisons between both countries in scientific literature. Consequently, the major motivation of this work comes from its novelty as well as from the need to understand to which extent the innovation pays off competitiveness and its causal-effect in international activities and secondly, how much Portugal and Latvia are reaping from these dynamics.

This work is expected to contribute for a clear comprehension of the relation among innovation, competitiveness and internationalization subjects supported by the

[1] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and UK.

[2] The current candidate countries are Albania, the former Yugoslav Republic of Macedonia, Montenegro, Serbia and Turkey, according to European Commission's website (http://ec.europa.eu/economy_finance/international/non_eu/candidate/index_en.htm), retrieved in 21st of October 2015.

related variables identified in the literature review. From them, it will be empirically study to which extent the Portuguese and Latvian firms are innovating and competitive-ridden.

This work is structured in 5 chapters. After this introduction, in chapter 2, will be the exposition of the related-field scientific works in order to disclosure the definition and evidence of innovation effects, the role of internationalization within innovation and their causal-effect evidence and then the benefits of competitiveness' achievement. Next, in chapter 3, it will be described the data and methodology used in this work, based on the previous literature review. The chapter 4 is the applied part of this dissertation where both countries under this study will be empirically study and compared through the deployed analysis and the respective results. In the 5th and final chapter will be made an overview of the conclusions and then, some final considerations.

2. Literature Review

The aim of this chapter is to investigate and review the scientific literature on seminal works and the state of art accordingly to innovation, internationalization and competitiveness matters. Additionally, a few statistical reports will be mentioned in order to understand how these three subjects are being measured.

2.1. Innovation

According to the OECD (2005, p. 46) "*innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations*"

The Schumpeter's evolutionary theory (1934) postulates that entrepreneurship and innovation have an important role in economic development and are in the centre of the main discussions, not only in the International Business and Economics field but also in the International Trade subject. Schneider (1975) refers that Schumpeter classified innovation in 5 types: new products, new methods of production, new sources of supply, exploitation of new markets and new ways to organize business. But according to Fagerberg (2005) throughout the time scholars in general has been focusing only in the first two types, i.e. new products and new production processes.

Hall (2006) refers that there are three pillars through which these kind of innovative activities can prevail successfully: the invention (newness), its commercialization (innovation) and its diffusion among the population. The same author state that is pertinent understands the process of diffusion since activities of research and development (R&D), technology transfer and novelty are relevant for the economic and social welfare.

In Figure 2.1 it's presented the linear model of innovation scrutinized by Godin (2006), where the innovation process starts with basic research then, this initial research is applied and developed towards its production and diffusion.

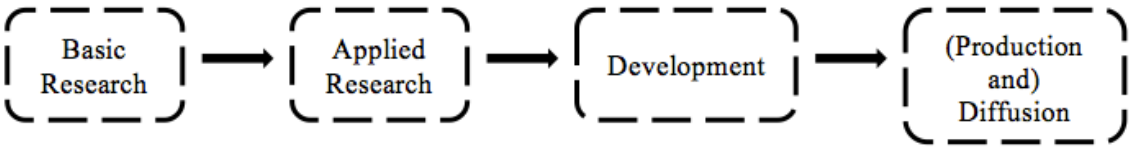

Figure 2.1 - Stages of Innovation

Source: Author's adaptation from Godin (2006, p. 639)

The linear model of innovation was built in order to link and understand the relation between science and technology to the economy concerning the main three policy matters: provide public support on academic research (basic research), the strategic importance of technology for industry (applied and developed research), and the impact of research and development (R&D) on the economy and society (production and diffusion) (Godin, 2006).

Likewise the previous model, the National Innovation System (NIS) is a result of efforts exerted by authors, namely Freeman (1987), Lundvall (1992), Nelson (1993) and Edquist (2001). Freeman (1987) refers to the NIS as a network of institutions, whether public or private, whose activities and interactions lead them to initiate, import, modify and diffuse new techonologies. For his side, Lundvall (1992) developed the concept of NIS in a work where he argues that the NIS is based on elements and relations within production, diffusion and new knowledge, that are endowed of economic utility. Moreover, he stress that the production structure and the institutional framework are the most important dimensions, by aknowledging that these systems are influenced by economic, political and cultural factors that help to define the scale, direction and success of all innovation activities.

Within the same scope, the Triple Helix model (Etzkowitz, 1993; Etzkowitz & Leydesdorff, 1995) arises as a triad of university-government-industry dynamics that captures multiple reciprocal relations at different points of the knowledge capitalization process and thus, conducted as a non-linear model of innovation (Etzkowitz & Leydesdorff, 2000). Furthermore, Leydesdorff (2010) presents a more advanced perspective, illustrated in Figure 2.2, where the goal is to highlight the mutual interdependence and the complex interactions among the triad when occurring an event (e.g. patents).

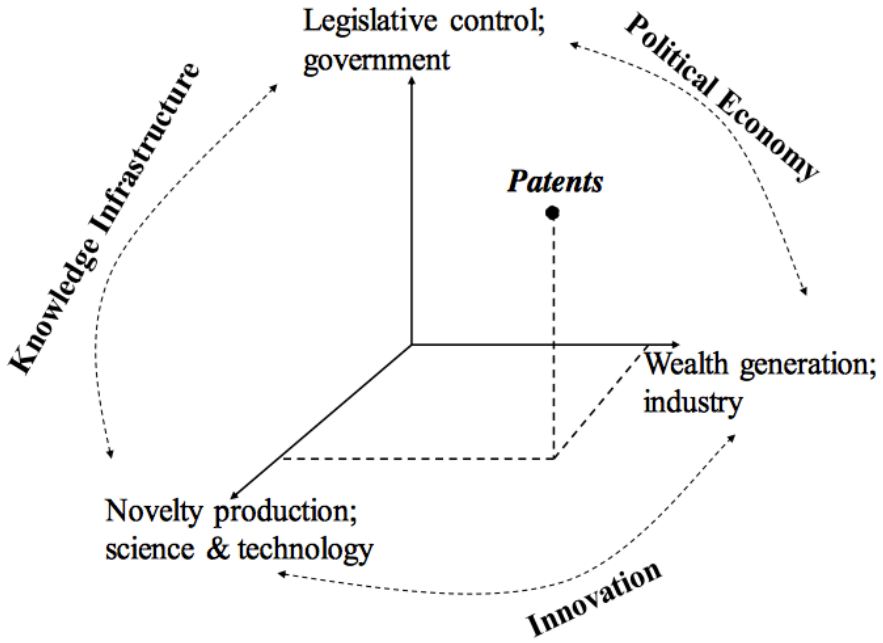

Figure 2.2 - Triple Helix Interactions

Source: Leydesdorff, 2010, p. 370

From this point, it is possible to understand that patent are positioned as an income to political economy but at the same time it's an output from science and industry. However, the main function of patents is to protect legally the intellectual property. Therefore, they are only one of the many events that occur in which the coordination mechanisms (i.e. a: wealth generation & industry; b: novelty production and science & technology, and c: legislative control & government) act together (Smith & Leydesdorff, 2012).

Innovation activities can be part of a nation's policy or within a business strategy. At the macroeconomic level, innovation is seen as a set of institutions that together or individually support the development and spreading of new technologies and provide tools through which governments form innovation-driven policies. Furthermore, Metcalfe (1997, p.289) refers that "*as such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artifacts, which define new technologies*". In the view of the United Nations (2012, p.3), the innovation that occurs at the microeconomic level is an aspect of "*business strategy, or part of the set of investment decisions to create capacity for product development or improved efficiency*".

As the complexity of the innovation concept increases, the same happens to the barriers for its measurement (Crosby, 2000; OECD, 2005; Smith, 2005; Sveikauskas, 2007; Wang & Kafouros, 2009; OECD, 2010). In other words, the existent wide scope underlying the innovation process can also bring also problems and constraints to the discrimination of what can be measured or not (OECD, 2005). The very authors, that exerted efforts in order to get the best of the innovation proportions, concluded that any of their methods are 100% suitable or didn't even considered the job done.

So emerged the Innovation Union Scoreboard (IUS) in order to measure the innovativeness of the EU members' states among 25 different indicators, presented in Figure 2.3. These indicators are discriminated in 3 categories: enablers are the necessary resources for R&D; firms' activities are the resources and efforts already deployed in novelty; and outputs concerns to the results from the institutions and firms activities (European Commission, 2014).

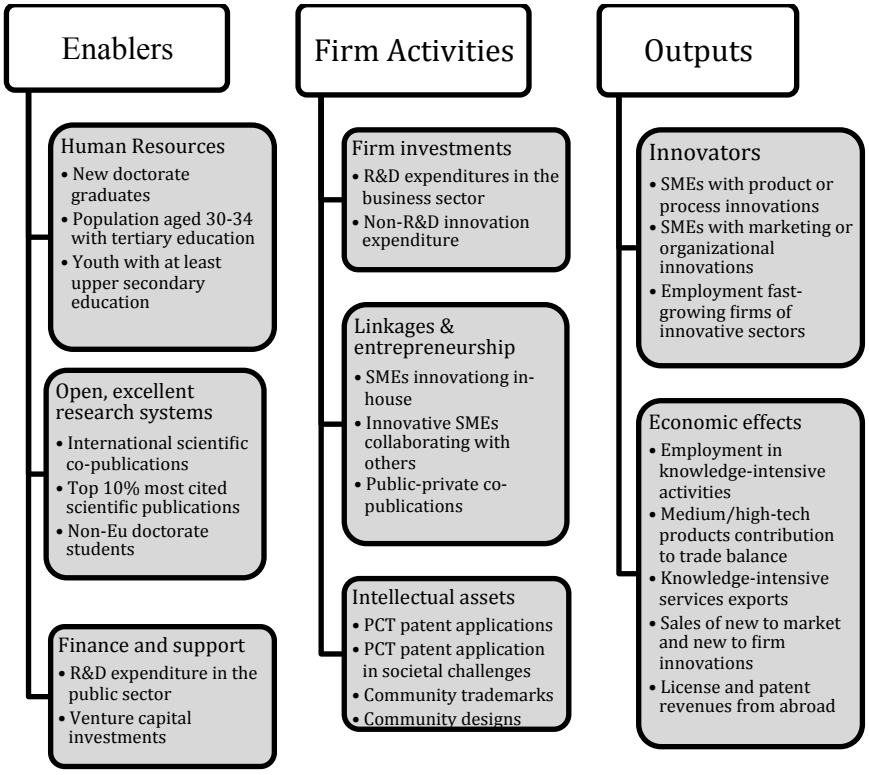

Figure 2.3 - Measurement Framework of the IUS

Source: Author's adaptation from European Commission (2014)

Furthermore, the innovation activities can be in the shape of the classic modes (i.e. product or process innovation) but also through the share of innovative products sold on the market, number of patents and the share of R&D over total investment (Altomonte et al, 2013).

Assuming technology-based innovation, it can be seen from a macroeconomic perspective that innovation can be quantified through the Gross Expenditure on Research and Development (GERD) since it is related with the innovativeness advances within economic growth (Godin, 2003). However, the indicator mentioned before cannot be taken as a good reference since it includes other factors than technology related ones (Smith, 2005).

Nonetheless, despite the investment efforts in R&D, it doesn't mean that it will bring profit or growth (Griliches, 1998). There are authors advocating that the investment in R&D has positive return rates (Hall, 1995; Adams, 1996; Sveikauskas, 2007) and, on the other hand, there are those that state that investing in R&D can play a negative role, limiting the firm's economic growth (Link, 1981; Sassenou, 1988). Even though the major of the research findings have commercial potential, the rest doesn't, yet, they have a small economic value but not enough contribute for growth. Actually, this potential is a small portion of the total R&D made-in state or universities – a quarter or less (Sveikauskas, 2007).

The R&D is part of the first stages[3] of the innovation models mentioned so far[4] and thus, likewise R&D, patents are considered part of the innovation process that occurs on the society (Crosby, 2000). But according to the latter author, R&D and patents cannot be taken as a proxy of the innovation level since they are inputs of innovation process and thus, they just quantify part of the puzzle. However, it's still preferable to use patents data not only because it's also related to innovation outputs rather than R&D but also patents data are available for use for a longer period of time than R&D. On the other side, Smith (2005) and Godin (2004) state that the R&D, as a measure of innovation, is by far the most used indicator to do so[5].

[3] Demonstrated in Figure 2.1

[4] About the Linear Model see Godin, 2006; for NIS's see Freeman, 1987; and for Triple Helix Model see Etzkowitz, 1993; Etzkowitz and Leydesdorff, 1995.

[5] For a deeper comprehension about the evaluation of R&D performance consult Rene, 1990.

Hölzl and Janger (2014) developed a 'technology frontier' in order to identify, among eighteen countries, barriers to achieve novelty. The authors built this frontier based on the development level indicators such as gross domestic product (GDP) per capita and found two types of obstacles to innovation occurrence according to the distance to the frontier: cost-based and knowledge barriers. The countries with lower distance to the frontier face knowledge circumstances while the more distant ones have related-cost barriers.

Concomitantly, the authors Hölzl and Janger (2014) categorized these known obstacles as related with facts, explanations, skills and networks, and expected that the closest countries to the line understood the importance of these barriers as part of a learning process and thus, perceiving the knowledge as a key factor to competitiveness. Far from the frontier, flaws in the national innovation systems or financial support on projects are pointed as the main precarious situations. Regardless of that, it's more stimulating to look for the innovation barriers rather than causes, which according to these authors help us to identify and, consequently, focus on these impeditive circumstances.

Empirical Evidence

During the crisis, EU countries handled investment in research activities, but the quantity of this investment decreased substantially and so its propensity to expand on further innovation. The most impaired economies were those located in Central and Eastern Europe (CEE) that previously had beneficiated from a catching-up process. But the ones that are confident with their NIS should not worry, except for the Southern economies that lost relative market share because of their weak system (Filippetti & Archibugi, 2011).

The education system must be well integrated in the NIS in order to connect the scientific research within the business, where the market develops and economy happens. In this specific case, Eastern Europe has a lot of flaws in linking universities with the private sector, being recommended by Krammer (2009) that it should be created and supported an innovation-driven policy with the right amount of investment. For the EU, these connections from education institutions and R&D activities represent 24% of the total of the European R&D dynamics (Raluca, 2011). Despite of that, innovative activities happened in the east side of Europe even under harsh economic conditions (Krammer, 2009).

Innovation-based policies were implemented in Eastern European Countries (EEC), but this doesn't mean that they are efficient. Precisely, the performance of these National Systems is under their capabilities (Kravtsova & Radosevic, 2012). These authors left some recommendations in order to guide the policy-makers towards a sustainable path, such as, engagement and measurement of these systems, as well as effective policies. Also, cautioning that those shouldn't be restricted only to new knowledge, but enhance R&D activities that EEC's already have and diffuse them in order to take opportunities and advantages (Kravtsova & Radosevic, 2012).

The number of patents is a basic indicator for the level of country's R&D but in Eastern Europe, the patents level is highly connected with the private R&D financing (Krammer, 2009). Actually, even for the EU the same happens (Raluca, 2011). The biggest investments made are in high-tech and intensive-knowledge sectors, making them rely highly on exports (Filippetti & Archibugi, 2011).

To what concerns the Baltic States (composed by Lithuania, Latvia and Estonia), they have been making efforts towards clear innovation-driven policies. Comparing policy's design, delivery and evaluation, Karo (2011) concludes that Estonia is the more active state, giving space for the business to play a role in it. All of the three countries, not so long ago, entered in the EU so, overall, they are still building their own innovation policies based on the ones followed by the other EU's members. Another work (Dubra, 2013) confirms the leading position in the innovation field by Estonia. Even though the state's role on building these policies is active, yet, it's not enough for a competitive performance. On the other side, Latvia, Lithuania and Estonia seem to be in the right path regarding firms' internal factors, such as human capital, innovation-driven strategies and collaborations. In Latvia, normally, innovation occurs in products or organization sphere, while in Estonia and Lithuania it's more likely to occur in products or processes (Dubra, 2013).

Moreover, not only at the macroeconomic level it is possible to study the factors related to innovation, but also at microeconomics level, at least it's what Roper and Love (2002) comment in their work. They studied individual manufacturer firms from United Kingdom (UK) and Germany. Presuming that all firms are product innovators it's possible to conclude that firms from UK are extremely correlated with exports probability and propensity. While in Germany, being a product innovator is highly related with companies'

exportation but these innovative activities lead them into a less likelihood of firms' exports happens.

Regarding the firms behaviour, Fagerberg (2005) disclosed how fast firms should be in order to be an innovation leader and running alone towards podium to collect the potential rewards. At the same time, there are those that assert that sharing these findings among other firms/consumers may have a positive effect (Hall, 2005). However, these effects can be '*direct or indirect*' (Ibid p. 471), where the first one creates a higher level of effectiveness in communication since all of those involved are speaking the same language. The indirect effect turns possible a long life cycle for that technology, giving space for incremental improvements (Schneider, 1975) throughout the years (Rogers, 1995).

According to the latest studies mentioned by Schneider (1975) and Fagerberg (2005), the big firms are the first ones to adopt new technologies, consequently, having privileged access to research field and thus, becoming the innovation leaders. In consequence, the propensity to patent is also bigger in large firms rather than small ones (Arundel & Kabla, 1998).

The results of a survey connected with some R&D patterns of 186 European firms (European Commission, 2014) seem to be relevant, since one fifth of the firms made their research activities outside of the EU borders. Still, their R&D focus are inside of the EU, thereof, two out of three firms believe in their home country as the best one to invest, followed by United States, Germany, China and India as preferences.

At the same time, European-based companies seek for new potentials on the emerging economies. Overall, the assessment of the R&D attractiveness is based on human resources, the opportunity to share information and the nearness with other firms. On the top three of the attractiveness criterion within EU are the quality of researchers and the knowledge transfer opportunities among universities and public organizations (European Commission, 2014).

Comparing the previous statements with the ones about the United States, it's possible to know that the knowledge sharing and the levels of R&D, collectively with the leading factors that both intervenient pursue, are the standards. Nevertheless, the answers to what concerns China and India show quite different results, being the in-house research

activities the most appreciated, coming after the market analyses, product quality and action-steps to support innovation (Ibid).

2.2. Internationalization

Internationalization is a process of geographical economic activities' expansion over the national country's borders (Ruzzier, Hisrich, & Antoncic, 2006). This process escalated after the World War II until the 1970s, when the globalization phenomena[6] started to emerge. More specific, the internationalization can be seen as a process in which is developed several businesses' networks through extension, penetration and integration in other countries (Lehtiten & Penttinen, 1999).

The international economic activities considered are firms that export or import goods or services, outsource internationally, are suppliers of a foreign producer, have undertaken a foreign direct investment (FDI) or are owned by foreigners (Altomonte et al., 2013).

Some theories and approaches help to explain the internationalization process[7]. The Uppsala internationalization process model (U-M – Johanson and Vahlne, 1977) explains how firms gradually intensify their activities in foreign markets. According to Andersen (1993) and Rodriguez (2004) firms first gain experience from the domestic market before they move to foreign markets (stage one) and then firms start their foreign operations from culturally and/or geographically close countries and move gradually to culturally and geographically more distant countries (stage two). After that, firms start their foreign operations by using traditional exports (stage three) and gradually move to using more intensive and demanding operation modes (e.g. sales subsidiaries) both at the company and target country level (stage four). Andersen (1993) cites that the innovation-related international model (I-M) derived from the Roger's stages of the adoption process (Rogers 1962). This approach, in turns, defend that the internationalization itself is an innovation.

On the other hand, the Cavusgil's stage theory of small and medium enterprises (SMEs – 1980) cited in Gankema, Snuif and Zwart (2000) refers that the

[6] According to Ruzzier, Hisrich and Antoncic (2006, p. 477) globalization is refered to "*a stage in which the firm's operations are managed on a global scale, not in just a few selected countries. It is characterized by the worldwide integration of ever more competitive markets and companies facing global competition*".

[7] The Theory of the Firm (Cyert and March, 1963).

internationalization activity is explained by other five stages, whereas not gradually dependent of each other. These levels are: a domestic marketing stage, a pre-export stage, an experimental involvement stage, an active involvement stage, and a committed involvement stage.

The Heckscher and Ohlin theory (H-O – 1949) uses explicative factors such as, labour and capital, defending that the ones in abundance will be exported and the scarce ones will be imported, regarding the country's factor endowments. Allegedly the H-O model arose as an alternative to the Ricardian Model of comparative advantages, according to Kojima and Ozawa (1984). Ricardo's theory was rather important for trade flows between countries, yet he did not assume the possibility of technology transfer through FDI (Ozawa, 2007).

Ethier (1986), during his attempts of creating a rudimentary model, argues that one of the motives of a company's internationalization is due to a stable featuring contract, which ensures quality and incentive systems. Also, as a result of his rudimentary model, this author shows that the presence of multinational firms is positively related with the size of uncertainty when facing factor endowment's agents.

His theory encompassed relative factor endowments, which have a positive impact in the creation of direct investment and the beginning of the intra-industry relations. With this, it can be said that this model was back then, an alternative, or complementary, to the Kojima's hypothesis (Kojima, 1978; Kojima, 1982) based on comparative advantages. Dunning (2001) wrote that the Kojima's theory was able neither to explain why entities should invest through FDI and intra-industry cause.

A controversial model is the one developed by Dunning (1977) – The Ownership Location Internalisation (OLI) Model, or initially called The Eclectic Paradigm. The Ownership advantages are related to the firm's unique features that allow them to take abroad investment opportunities; the country's locational advantages addresses attractiveness for foreign investment; and the internalisation advantages derives from the internal markets that enable firms to suppress the costs associated with the external operations. Dunning (2001) concludes that the entire innovative outcome of the multinational enterprises (MNEs) is a result of the influence of their home country policies and cultural values. Furthermore, he has also argued that all basic management statements, such as mission, long-term vision and decision-making capacity are crucial for an

international activity to succeed. Therefore, a propitious environment for valuable products is the one capable to allow firms to learn internally but interact externally, giving space to risky actions within the industry market where it operates (United Nations, 2012).

When we come across patterns in internationalization and its dubious impact, it easily comes to our mind the paradigm of firms expanding their business into the closest countries (Linder, 1961; O'Grady & Lane, 1996). Which can be a barrier for the innovation process and business potential, because the firm's expertise might be constrained by closest distance and hence, assume that both countries have the same values, tastes or other features. In this way, the penetration in the market may be compromised and the company will fail only because it didn't do the necessary homework and analysis. Although, firms can only benefit from their innovation activities if their international presence is higher than a threshold level (Kafouros et al, 2008).

From the authors' point of view (Hitt, Hoskisson, & Kim, 1997), product diversification plays an important role in firms' performance, asserting that it has a positive impact in R&D intensity. But as the international diversification increases the performance of companies' decreases, because of its complexity. And yet, once again, it's revealed that transnational synergy lays down benefit for all the market makers, creating non-imitable competitive advantages. For Wernerfelt (1984, p. 178), firms' product diversification can also mean firms' resource diversification since it "*gives a different and perhaps richer perspective on their growth prospects*".

Outsourcing makes it possible to have a customized agreement upon several issues, including transaction costs and contractual imperfections, which, if too high, companies might undertake direct investment, instead. Besides the cost saving, FDI also turns possible to operate in foreign markets without paying the exports' costs associated (Altomonte et al., 2013). To what concerns the inputs of these international dynamics, these authors disclose that companies who adopt relatively simple modes of internationalization (i.e. exports) use alternatively R&D or imports as sourcing strategy: for these companies R&D and imports appear to be substitutes. In the case of more complex internationalization models (i.e. outsourcing or FDI), R&D and imports are used as complementary strategies.

Innovation and Internationalization – Empirical Evidence

"*Policy makers have traditionally attempted to encourage internationalization, with the implicit understanding that internationalization is associated with productivity growth and hence economic growth. Innovation is the channel through which productivity growth happens*" (Cassiman & Golovko, 2011, p. 57).

The previous sentence demonstrates that it isn't consensual that internationalization plays as a catalyst of innovation and competitiveness or that is a consequence of these acts, but some authors (Raluca, 2011; Auziņa-Emsiņa & Ozoliņa, 2014; Boermans & Roelfsema, 2015) categorize internationalization as a boost to increase their business, i.e. the internationalization of research activities is a driver of innovative firms and country's competitiveness. On the other hand, the innovation on products affects firms' productivity, and does so the probability of the company expands into a foreign market. So, in the Kotabe, Srinivasan and Aulakh (2002) point of view it's the innovation level that leads into an internationalization process.

Filippetti, Frenz and Ietto-Gillies (2011), likewise Damijan, Kostevc, and Polanec (2010), study empirically the causal-effect amongst innovation and internationalization. The first work states that internationalization and innovation are significantly positively correlated and dependent of each other. The second article found no evidence neither between innovativeness with the propensity to export and past exporting with products' innovation.

It is not easy though separate the origin of such activities from the policy-makers to the micro agents since the firsts turns possible a propitious environment for innovative and competitive behaviours and the seconds deploy internal actions towards novelty and competitiveness (as already described in previous sections, but explicitly argued by Porter, 1990). The wheel underpinned of the economic structure is the productivity. As the matter of fact, the higher is the productivity the bigger is the competitiveness degree. To reach this stage, firms had the need to gain market position through abroad activities, which can be a simple agreement affair or a deep engagement in the process of internationalization (Porter, 1990). Damijan, Kostevc, and Polanec (2010) found a positive impact on the productivity efficiency while exporting, which is indirectly related to process innovation, but only among medium and large companies.

Coe and Helpman (1995), cited by Crosby (2000), found out that a foreign R&D activities had positive effects on domestic productivity and as well that these effects have a deeper impact as the more open the economy is. Thereof, a transnational innovation is being disseminated worldwide throught its diffusion of multiple capabilities (Gerybadze & Reger, 1999). The capability to identify crucial knowledge and apply it holds on the innovation process a big contribution, as well as the inter-dependent flow between innovation and internationalization activities. The knowledge diffusion seems to be a spill over for internationalization (Sveikauskas, 2007).

Ariffin and Figueiredo (2004) found firms that innovated to be more competitive by reducing their costs, being more productive, reducing lead time and producing better products—regardless of whether they were in a domestic market-oriented country or in an export-oriented country. At the firm level is also possible to learn and innovate from export's activities by production innovations and patent applications (Salomon & Shaver, 2005). More specific, outsourcing is connected to product innovation, whereas exporting and FDI are associated with R&D spending and patenting (Boermans & Roelfsema, 2015).

The share of exports in Portugal is characterized by low-tech sectors translated in the non-significant innovation intensity, as a specific-country feature. If there is a lower knowledge creation, the propensity to innovate is also lower and, consequently, there is less information to make one's own innovation, thus, not having space for the appropriation of such mechanisms. Yet, for Germany, the exports' shares seem to play a positive role in the appropriability of the firms (Faria & Sofka, 2010).

It is possible to explore the types of internationalization that firms would take and further, evaluate their internationalization and innovation intensity measured by the international and innovation activities that firms are, respectively, involved (Altomonte et al., 2013). The results show that the larger and more productive firms are, they exhibit both higher internationalization intensity and higher innovation intensity likewise who tends to be outsourcers and FDI providers than other internationally active firms. At the same time, the ones under outsourcing or exporters tend to be smaller and less productive than importers.

Altomonte et al. (2013) postulate that there is a positive and significant association between internationalization and innovation whose strength grows with the complexity of the internationalization mode adopted. Nonetheless, the association is still significant at

low levels of internationalization complexity which implies that, large and more productive firms are clearly the main drivers of internationalization and innovation, these activities are not only concentrated in their strict group. In particular, whereas internationalized firms are larger and more productive than non-internationalized firms, innovative firms are larger but not necessarily more productive than non-innovative firms. "*Further, both imports and exports are highly concentrated among few firms*" (Ibid, p. 10).

As a matter of fact, the imports can also have an impact on firms' subsidiaries, particularly when importing intermediate goods, which improves their productivity. Furthermore, imports can have three kind of effects within firms: variety effect, where the intermediate goods can improve production efficiency; quality effect, which addresses for a possible better quality of broader intermediate goods; and learning effect, where firms absorb the technology incorporated in the imported goods. Similarly to the exporters, the firms that have importation activities are larger, more productive and more capital intensive than non-importers (Altomonte et al., 2013).

After the results, some tips are highlight about EU policies in order to adjust the ones currently on the system towards an accurate course adoption of the business field, especially SMEs. Altomonte et al. (2013) hold forth the unlikelihood of a sustainable journey of singular mode of internationalization (i.e. exports – the main policies focus) since the other modes are equally feasible. They also advise decreasing the trade costs in a way to instigate the countries towards innovation and R&D activities. Secondly, the role of the EU's institutions should be higher and more coordinated in order to provide in-house frameworks that could lead specific sectors to reach the international network. Both points are valid either at national and EU levels.

2.3. Competitiveness

Competitiveness is underpinned to national prosperity, e.g. the capacity to innovate and upgrade its business sectors and overcome the tight competition of nowadays with economic valuable things for the society. Competitiveness is no longer related with factor endowments that nations possess, is a matter of creating a propitious competitive environment in which the firms will born and learn how to compete under a dynamic and evolving system (Porter, 1990).

Competitiveness can also be conceptualized from the business perspective where the wealth of nations is created (Porter, 2004). Moreover, companies to be competitive need to achieve high levels of productivity and keep these high standards over the time by raising the product quality and technology, adding unique features or improving the efficiency of the production process.

Competitiveness, as we see it nowadays, can be a positive-sum in which all countries that are partners in trade can benefit, the same argued by Smith (1937), since each country focused only in their specialized goods and thus, having absolute advantages over that products. The difference in the timespan brought differences also in the competitiveness' components, since back then these components were based on land, labour, capital and natural resources.

Ricardo (1971) extended the latter theory of absolute advantages for the comparative advantages theory referring that even if the country didn't possess any absolute advantage, it could still benefit from the international trade. According to Cho and Moon (2013) Ricardo could't justify the differences in comparative advantages between countries but then arises the Heckscher and Ohlin model (H-O, 1949) defending that these comparative advantages have origin in differences of factor endowments[8].

Porter (1990) developed the Diamond Model of nation's competitiveness emphasizing that there are four essential ingredients for achieving international competitiveness successfully as illustrated in Figure 2.4.

[8] More theories have arised since then, e.g. the Product Cycle theory (Vernon, 1966), Country similarty (Linder, 1961), Economies of Scale (Krugman, 1979; Lancaster, 1979) but I will proceed for recent models.

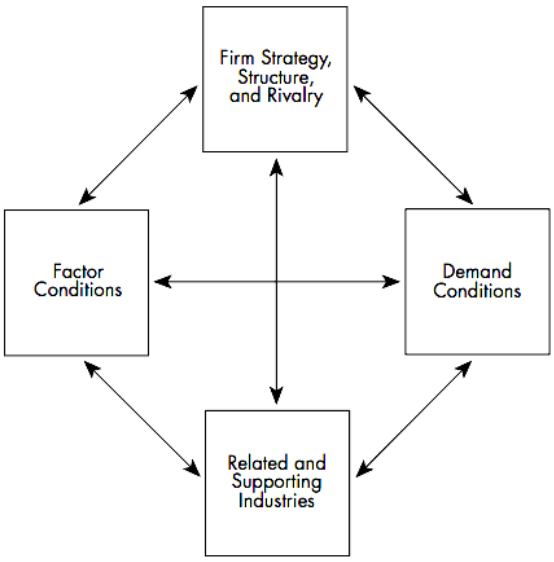

Figure 2.4 - Determinants of National Competitive Advantage

Source: Porter (1990, p. 78)

Factor conditions are related to labour skills, resources and infrastructure necessary to be competitive within a given industry; demand conditions are shaped by the opportunities that companies take and by the directions to make them real; related and supporting industries are underpinned to the presence of industry's suppliers that are internationally competitive and make pressure for firms invest and innovate; and firm strategy, structure and rivalry are part of the internal environment, in which the firms born, so important to make the system work.

Bris and Caballero (2015) from the International Institute of Management Development (IMD) also developed a framework in order to explain the aspects attached to competitiveness as demonstrated in Figure 2.5.

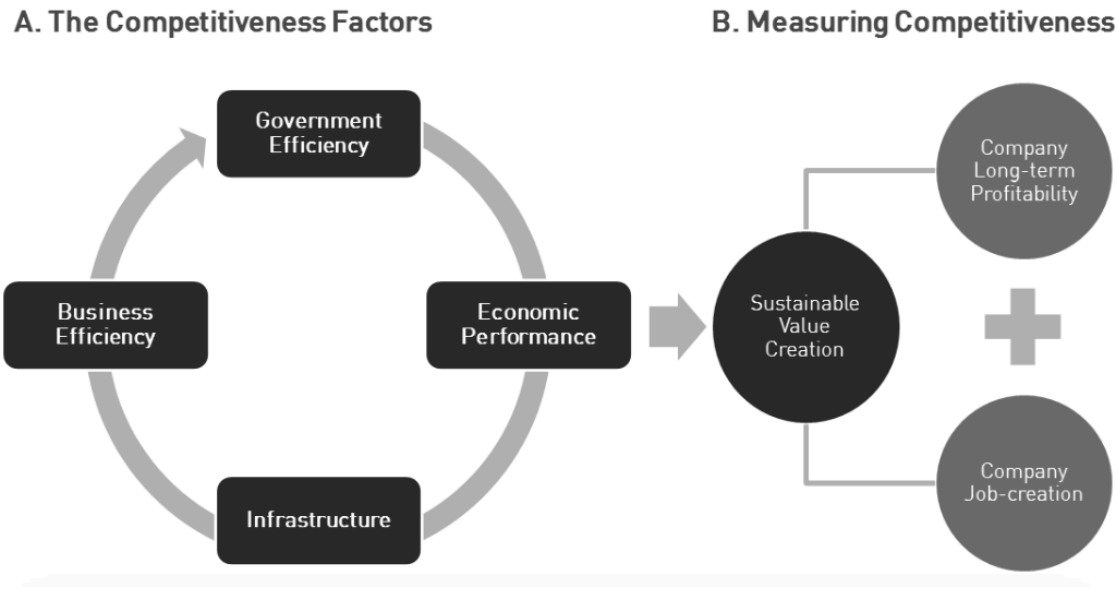

Figure 2.5 - Overview of Competitiveness by IMD

Source: Bris & Caballero (2015, p. 493)

These authors argue that there are a bridge that links the current structure of competitiveness towards a sustainable value creation. The government efficiency is related to legislation and institutional policies through which government influences the economic performance and competitiveness; the infrastructure available play an important role, although they can limit the business efficiency. They also defend that competitiveness is not static (likewise Porter, 1990) and thus, this model is not linear and each of this four pillars serves to strengthen each other as a virtual cycle.

From the previous models, it seems that a new competition model has been arising within the last decades - '*policy competition*' (UNIDO, 1999, p. 55), where each country tries to get the best of their national competences in order to provide a friendly business environment for firms that compete internationally and increase their performance. A catalyst of this new tool can be provided by Triple Helix concept[9] (Etzkowitz, 1993; Etzkowitz & Leydesdorff, 1995) in which all the national performance can be monitored among the key players of the development of international competitiveness - institutions, government and industries.

On an early work of the IMD (International Institute for Management Development) it is mentioned in one of its "*Golden Rules for Competitiveness*" (Garelli,

[9] Illustrated in Figure 2.2 of the Innovation section.

2006) that a country for being or stay competitive needs to have a higher level of attractiveness in the international community in order to attract foreign investment (as also defended by Raluca, 2011). This happen as a result of an efficient alternative to gain or benefit from unique competitive advantages, e.g., in R&D, new technology, new or further knowledge. Indeed, Michael Porter (1990) mentioned in Freeman (1995) may well be right in his contention that the intensification of global competition has made the role of the home nation more important, not less.

At micro level some approaches and models explains competitiveness. The Resource-Based View (RBV) model arises as a foundation for a better understanding of the firms' competitive features (Barney, 1991). These competitive advantages derive not only from intangible assets but also from tangible ones that firms controls, as long as its resources and capabilities are valuable, non-imitable and non-substituted. According to Peteraf (1993) this model will not increase the competitive position of firms but will help to optimize the resources that each firm already controls.

According to United Nations (2012, p. 3) recent studies have focused on "*the idea of 'sunk costs', irrecoverable commitments of resources to enter new markets or to create competitive advantages by repositioning production or output in the value chain*". Thereof it's important for firms to invest in innovation activities and strategies to overcome the competitors and contribute for its economy added value. A higher productivity is reached by the high quality and features that the output encompasses and thus, contribute to the market prices. Additionally, the production efficiency is considered and if does, the added value of the final goods and services will be higher (Porter, 1990).

On the other side, failure can also be a learning process, and it does so through the market activities where it is possible to watch the patterns of some cross-border economic proceedings and classify them. If the firm is multinational, it's possible that this entity had the support of alliances in the host country in order to minimize risk and uncertainty and maximize their operations (Dunning, 1988). Actually, Dunning (Ibid, p. 6) refers that *"in a more competitive and less risky environment firms would have less impetus to engage in international direct investment"*.

Although, the national competitive advantages are different from country to country, the work of Rugman, Oh and Lim (2012) tell us that on the other side of the same coin, home region and global competitiveness do not differ from country to country.

Furthermore, it seems that most part of multinational firms have difficulties in transferring these home region unique features into the foreign market where they operate. A big conclusion, in the shape of a warning, it's that countries' and firms' dynamics are complex and need to be understood in order to align all of the competitive strategies that those involved seek (Rugman, Oh, & Lim, 2012).

Measurement and Empirical Evidence

According to Archibugi and Michie (1998) there are three important links between innovation and international competitiveness: the production or process innovations decreases the associated costs and hence output prices, increasing competitiveness; the production minor upgrades increases its quality which in turns make them more attractive both in domestic and foreign markets; and if these product innovations are big then they are capable to create monopolistic advantage position and benefit from temporary high profits.

For instance, series of the Global Competitiveness Index (GCI – Schwab, 2014) is being launched in order to provide an overview of the economic and competitiveness performance of 144 countries over 100 indicators aggregated in 12 main pillars that readers can better understand at the Figure 2.6.

This comprehensive assessment states that "*the social and environmental dimensions of an economy need to be fully considered in any growth or development agenda*" (p.xiii). Through this kind of assessments the EU can foresee the member states' needs in order to make them thrive and breakout from the economic crisis (Priede & Pereira, 2013). A scenario not so positive for the EU-27 economies is the fact that only 32% of the overall companies in 2008 brought to the market completely new products, which means that in EU both MNE's and SME's tend to be more adaptors than innovators. A reason pointed out by Raluca (2011) encompasses the lower level of abroad diffusion of the European R&D activities, despite the excellent internal environment for the evolvement of those activities.

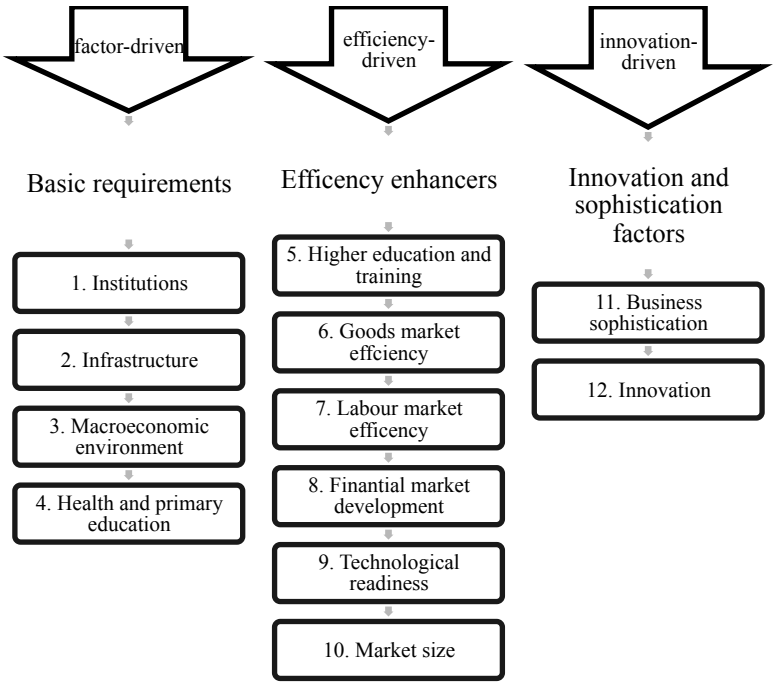

Figure 2.6 - Measurement Framework of GCI

Source: Author's adaptation from Schwab (2014)

This linkage of a temporary competitive advantage with globalization phenomena led companies from the CEE countries[10] to benefit from a catching up cycle between 1994 and 2004 (Igan, Fabrizio, & Mody, 2007). Translating into smaller parts, more open markets together with less restriction, more business flexibility and other dynamics made these 8 countries increase their product quality and, consequently, their competitiveness. According to Igan, Fabrizio and Mody (2007), the quality was measured and translated into a bigger market share, along with these products/services' upgrades.

Another positive evidence was observed when studying the relationship between the labour productivity and the competitive level in Italian firms, mostly in 2002 and 2005 (Laureti & Viviani, 2011). With this, the same authors concluded that it can be due to the small companies have successfully reached some niche markets, while big companies were fustigated by the industrial region where the firm was integrated during economic crisis, except the ones in the Clothing and Textile sectors.

It is known that the United Kingdom (UK) in the last centuries was one of the world's economy leaders, but since the 19th century, its position has been dropping mostly

[10] They are the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic and Slovenia.

because of the catch-up phenomena that brought other economies to the race. According to OCDE data from the 1970s, the UK's foreign direct investment (FDI) indicators stabilized, but the authors could observe, comparatively, that UK itself came up with a relative faster declining of the country's competitive position, translated in less exports and output, than the rates observed in the outward direct investment made by its multinational enterprises (MNEs) (Nachum, Jones, & Dunning, 2001).

China and India are two of the most fastest-growing emerging economies and so, it's important to understand what strategies they are applying to get a competitive position in the world's economy. On a basis of a RBV, the authors Lva, Plecherob, and Basant (2013) attempted to explain the role of those firms had in the choice of their strategies. One thing is clear: each strategy requires different levels of firms' resources and skills. Both countries are thriving through cost-based options but they already started to bet on intensive-knowledge strategies, usually with the under developed countries as a target, but now also looking to the develop world as a potential destination. For instance, the number of Indian firms investing in various options, within their international competitive choices, is bigger than in China (Lva, Plecherob, & Basant, 2013)

3. Data and Methodology

The main purpose of this work is to study the contribution of the innovation activities to the international competitiveness within the scope of the Portuguese and Latvian economies. In other words, study the relation degree between innovation and international competitiveness in Portugal and Latvia and, at the same time, assess which sectors are internationally competitive and the underpinned potential.

3.1. Data

These analyses are based on nine individual indicators and three institutional reports, compiled by three groups: Portugal, Latvia and the EU. Two criteria were used in the selection of indicators: first, relevance to the analysis and, second, availability. The sources and timespans are presented in Table 3.1. The outputs are presented in graphs and tables.

The weakness of the developed methodology is the wide range of data sources, i.e. the different methods that each source uses to reach the respective results and the non-alignment of the time periods selected among the different indicators, which is expect to be criticized.

Indicators of the economic situation are the GDP per capita and forecasts based on GDP growth, inflation, unemployment, public budget balance, gross public debt and current account balance. The innovation is proxied by the gross expenditures on R&D and number of patent application, and its performance by the 25 indicators of the IUS presented in Figure 2.3. To study the international relevance were used indicators such as the exports, imports, net exports and foreign direct investment. Competitiveness is proxied by the real productivity and its current achievement by the GCI (Figure 2.6).

To what concerns innovation and international competitiveness the correlation analysis uses some of the indicators already mentioned: productivity, exports, GERD and patent applications. The sectorial analysis uses the exports as indicator by SITC one digit level.

Table 3.1 - Data and Sources

Indicator	Interval/Year	Source
1. GDP per capita	2005-2014	Eurostat
a. Economic forecasts	2013-2016	European Commission (2015)
2. GERD as % of GDP	2005-2013	Eurostat
3. Patent applications	2005-2012	Eurostat
b. Innovation performance	2006-2013 (growth rate) 2014 (absolute performance)	Innovation Union Scoreboard (European Commission, 2014)
4. Exports as % of GDP	2005-2014	Eurostat
5. Imports as % of GDP	2005-2014	Eurostat
6. Net exports as % of GDP	2005-2014	Eurostat
7. FDI net inflows shares	2005-2013	Trading Economics
8. Real Labour Productivity per person employed	2005-2013	Eurostat
c. Competitiveness Achievement	2014-2015	Global Competitiveness Report (Schwab, 2014)
9. Extra-EU Exports by SITC one-digit level	2005-2013	Eurostat

Source: Author's compilation

3.2. Methodology

The methodology used was based on some related-field papers as presented in Annex I. This dissertation followed the same structure presented in the same table of the Annex I with a theoretical background firstly introduced and then the empirical part.

A linear correlation analysis was employed in order to perceive if the innovation and international competitiveness variables are related within Portugal and Latvia. Specifically, proxies of innovation are the gross domestic expenditure on research and development (GERD) and the number of patent applications. For the competitiveness was considered two different representative variables: productivity (Annex IV) and exports

(Annex V). They are measured using the Pearson product moment correlation coefficient, obtained by dividing the covariance of the two variables by the product of their standard deviations, according to Pereira, Bento, and Priede (2013).

The correlation coeffcient (*R)* interpretation is based on Rumsey (2011), where the author classifies as:

R= –1: a perfect negative linear relationship;

R= –0.70: a strong negative linear relationship;

R= –0.50: a moderate negative relationship;

R= –0.30: a weak negative linear relationship;

R= 0: no linear relationship;

R= +0.30: a weak positive linear relationship;

R= +0.50: a moderate positive relationship

R= +0.70: a strong positive linear relationship

R= +1: a perfect positive linear relationship.

To find out the international competitiveness of Portuguese and Latvian firms it was used a shift-share analysis to measure the exports competitiveness by United Nations (UN) Standard Industrial Trade Classification (SITC), related to the empirical part of this work (Annex VI).

The shift-share approach of this work is the main support analysis of the Portuguese and Latvian main competitive sectors and is based on the Esteban-Marquillas (1972) and Wilson and Hsien (1998) formulas (full calculations are in Annex VI). The shift and share method is employed here to compare changes in the Portuguese (PT) and Latvian (LV) Extra-EU28 exports at the SITC one-digit level between 2005 and 2013, having as a reference group the European Union (EU-28). First, it discloses the '*share effect'*, i.e. the changes that would have occurred if the exports in industry *i* of the competing economy *c* (Portugal or Latvia) to destination *j* (to non-EU members) had grown at the same rate and represented the same proportion of total exports as the reference group *r* (EU). Specifically:

$$\text{Share Effect} = E_{0cj} P_{0irj} G_{irj} \qquad \textbf{(1)}$$

Where,

E_{0cj} = Total Exports in 2005 (initial year 0) from PT or LV (*c*) to non-EU members' states (*j*);

P_{0irj} = The proportion of the industry's (*i*) exports in the Total Exports of the EU (*r*) to non-EU members;

G_{irj} = The growth rate between 2005 and 2013 in industry (*i*) of the EU (*r*) to non-EU members' states (*j*).

Any difference between the performance of Portugal or Latvia in relation to the EU in a given sector is referred to as '*export differential'* or '*shift effect*', according to Wilson and Hsien (1998), and measured in million euros. An improvement in the competitive position of Portugal and Latvia in relation to EU is observed by positive values and a weakening of this position in a given industry is viewed by negative values.

The export differential is composed by three additive factors, such as the industry mix effect, the competitive effect and the interactive effect (Herschede, 1991; Wilson & Hsien, 1998; Wilson, Chern, Ping, & Robinson, 2005), i.e. it shows how much of the diferential is due by the structure of the competing and reference economy (industrial mix effect - IME), how much of the deviation from what would be expected if the competing economy had behaved as the reference economy (competitive effect - CE), and how much is due to the interaction of structure and competitiveness (interactive effect - IE):

$$\text{Export Differential} = \text{IME} + \text{CE} + \text{IE} \quad \textbf{(2)}$$

The industry mix (IME) effect looks at how much of the differential is due to a difference in the industry's importance in the competing economy's structure when directly compared to its importance in the reference economy's structure (Herschede, 1991; Wilson & Hsien, 1998). It will be positive if a country's share of exports in fast-growing industries is larger than the reference group or its share in slow-growing industries is smaller; or negative if the economy is dominated by slow-growing industries:

$$\text{Industry Mix Effect} = E_{0cj}\left(P_{0icj} - P_{0irj}\right)G_{irj} \quad \textbf{(3)}$$

Where,

P_{0icj} = The proportion of exports in 2005 (initial year 0) in the industry (*i*) of PT or LV (*c*) to non-EU members (*j*).

The competitive effect (CE) shows the deviation in exports that is due to a difference in the growth rates of the respective industries in the competing country in relation to the reference economy (Herschede, 1991, Wilson & Hsien, 1998). If the growth rate of the competing economy is higher than the one observed in the reference group, this effect is positive at the given industry:

$$\text{Competitive Effect} = E_{0cj}P_{0irj}(G_{icj} - G_{irj}) \quad \textbf{(4)}$$

Where,

G_{icj} = The exports growth rate in industry (*i*) of PT or LV (*c*) to non-EU members (*j*).

The interactive effect (IE) measures the impact that is due to the difference between the structures of the competing economy and the reference economy interacting with the difference in industry growth rates between the competing and the reference economy (Herschede, 1991, Wilson & Hsien, 1998). Both articles state that the competing economy will benefit from a positive interactive effect if: 1) it has a positive industrial mix and competitive effect and hence, demonstrates being a specialized country in that given sector; or 2) it has both industrial mix and competitive a negative effect and thus, reducing the importance of the industry in which has a weak competitive advantage:

$$\text{Interactive Effect} = E_{0cj}(P_{0icj} - P_{0irj})(G_{icj} - G_{irj}) \quad \textbf{(5)}$$

The export data at SITC one-digit level of Portugal and Lavia as well as of the EU was collected from the Eurostat (2015) in which shows the Member States' contribution to the extra-EU28 exports for that product group between 2005 and 2013. Exports are expressed in value terms and measured fob (free on board) in million euros.

4. Results Analysis and Discussion

The following sections are the core part of this project, where it will be described and discussed the results from which were studied and analysed to what extent the innovation efforts made so far, by Portugal and Latvia, contributes for the competitiveness achieved by the both countries. It seems thus relevant present an economic overview at the first place in order for the readers' awareness of the economic environment within both countries. After, variables related to innovation, internationalization and competitiveness will be compared among Portugal and Latvia. Finally, the correlation among innovation and international competitiveness of Portuguese and Latvian firms will be shown.

Portugal is located in Western Europe while Latvia is positioned in Eastern Europe and both belongs to the European Union (EU) and hence, they can follow the strategy created by all the member states for 2020. Both countries had a bad economic performance these last years with a slow recovery by now. Portugal is more dependent from domestic demand and Latvia is high sensible to external conditions.

4.1. Economic Overview

In an economy, the Gross Domestic Product (GDP) is often used as an indicator of how well off a country is. According to Eurostat (2015) GDP includes goods and services that have markets (or which could have markets) and products, which are produced by general government and non-profit institutions. For measuring the growth rate of real GDP, the GDP at current prices are valued in prices of the previous year and the thus computed volume changes are imposed on the level of a reference year; this is called a chain-linked series. Accordingly, price movements will not inflate the growth rate. Real GDP per capita is calculated as the ratio of real GDP to the average population of a specific year.

The flow of the GDP per capita in the latest years is presented in Figure 4.1. The first impressions show Portugal and Latvia following the European trends in terms of growth prior to crisis and after, where Latvia seemed to suffer the most from 2007 until 2008. After 2009, both countries started to recover, even though Portugal has another

decline between 2011 and 2012. Currently, both economies are flowing towards a more equilibrate GDP per capita growth rate.

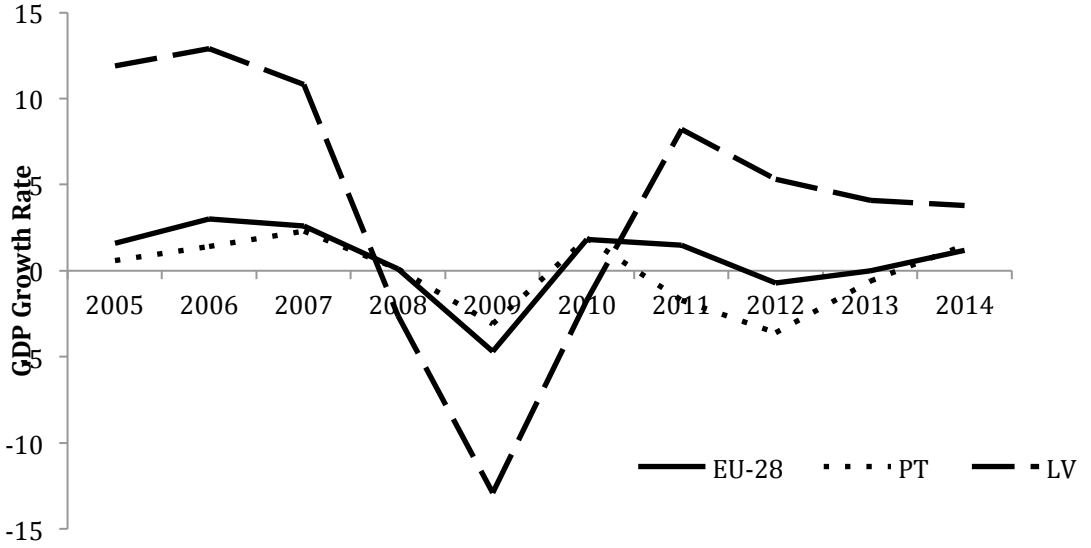

Figure 4.1 - Real GDP per capita growth rate

Source: Author's compilation; data from Eurostat, 2015

To what concerns Portugal, the GDP growth is significantly due to private consumption and, albeit to a lower extent, investments and net exports. The domestic demand is recovering and imports are growing at a faster rate than exports[11]. It has been foreseen by the European Commission (EC) staff that the finance markets and thus, external demand for inward investment will contribute for a medium-term economic growth. It's expected a decline in job creation but on the other hand, a stabilization of the employment rate with the GDP growth (Commission Staff Working Document, 2015).

The Latvian economic growth dropped almost 2% between 2013 and 2014, mostly caused by some external events, such as the sudden fall of the Russian Ruble's value and the conflicts between Russia and Ukraine. The uncertainty that urges to stay on the business and investment sectors may play a negative impact on the economy as well as on the exports activities and have offset the initial positive momentum stemming from the euro adoption. Domestic demand is expected to be the key to awake the economy as a consequence of the wages evolution and cheaper oil (Commission Staff Working Document, 2015).

[11] Further detailed in Internationalization section of the present chapter

The Table 4.1 focused only in the short timeline is intended to show at a glance the economic forecasts both for Portugal and Latvia. The economic forecasts for Portugal in 2015/2016 are positive, in a sense of improvements in the main economic indicators, compared to the prior years. The economic performance of Latvia so fustigated during the crisis, now may be following the European trends and consequently, better performances are foreseen.

Table 4.1 - Economic Forecasts Spring 2015

Indicators	2013		2014		2015		2016	
	PT	LV	PT	LV	PT	LV	PT	LV
GDP growth (%, yoy*)	-1.6	4.2	0.9	2.4	1.6	2.3	1.8	3.2
Inflation (%, yoy*)	0.4	0.0	-0.2	0.7	0.2	0.7	1.3	2.2
Unemployment (%)	16.4	11.9	14.1	10.8	13.4	10.4	12.6	9.4
Public budget balance (% of GDP)	-4.8	-0.7	-4.5	-1.4	-3.1	-1.4	-2.8	-1.6
Gross public debt (% of GDP)	129.7	38.2	130.2	40.0	124.4	37.3	123.0	40.4
Current account balance (% of GDP)	0.9	-2.0	0.5	-2.9	1.2	-2.3	1.4	-3.0

*yoy = year over year; Source: Author's adaptation from European Commission (2015)

Overall, real GDP growth in Portugal is projected to rise 1.6% in 2015 and 1.8% in 2016. The general government deficit reached 4.5% of the GDP in 2014, mostly due to the higher taxes collection – upgrades on policies against fraud and tax evasion, and also higher efficiency on the expenditure control. It has been forecasted an increase on the taxes revenues either from direct or indirect taxes as well as from social contributions. The gross public debt-to-GDP ratio reached 130.2% by the end of 2014, driven by higher cash reserves and the euro depreciation, and it's expected to fall to 124.4% by the end of 2015 and 123.0% by the end of 2016, supported by the projected economic recovery, the primary budget surplus and debt-reducing operations (European Commission, 2015).

In Latvia, inflation is expected to remain low at 0.9% in 2015 and 1.9% in 2016, reflecting the oil price effects. Nevertheless, inflation in 2015 is set to exceed the forecasted rate of 0.7% in 2014 as service prices are pushed up by the projected strong growth in wages. Fiscal performance is far from its potential because of the shadow

economic activities sharply presented on the country. The 2015 budget relies on effective implementation of new improvements in the tax administration system (Commission Staff Working Document, 2015). Additionally, fiscal policies should be guided towards private investment in order to compensate its flaws. These needs are constraining the investment on R&D and infrastructure that are far behind to what EU is expecting (Commission Staff Working Document, 2015).

From the microeconomic point of view, small and medium enterprises (SMEs) occupy the biggest slice in the business sector both in Latvia and Portugal. Specifically, SMEs play a bigger role in the Portuguese economy than in the other EU Member States, since the business sector accounts with 99,9% of SMEs, while in Latvia this share is 99,8%. The Portuguese SMEs account for 79% of employment and 66% of added value and the Latvian ones provide 78% of employment and 72% of added value, both of which are in considerably higher proportions than the EU average – 67% and 58% respectively (European Commission, 2014).

Despite the fact that both countries follow European trends, it might be viewed also as a bottleneck for both economies, since "*customers have learned to trust large companies and are more willing to try new products of known brands rather than those belonging to unknown start-ups*" (United Nations, 2012, p. 5). For Portugal it can strangle the country's potential by the mistrust of the domestic demand for 'innovations', sharply reflected in the Portuguese culture. For Latvia, the policies aren't driven to support R&D and thus, innovation sphere, taking simple sporadic actions in that way. Last but not the least, the decline of skilful labour that is striking the country through youth emigration and accurate training issues are some of the barriers that are blocking the creation of an attractive economic environment for non-Latvian investors.

4.2. Innovation Performance

"In the attempt to boost its international competitiveness, the European Union realised that it should enrich the ways to achieve it by using the intangible assets that it holds. Knowledge and intellectual capital, innovation, science and entrepreneurship are key drivers of economic development and renewal" (Raluca, 2011, p.1).

Therefore, the readers will be presented in this section with a few innovation-related indicators of Portugal, Latvia and EU, such as GERD and patents. Next, will be analysed the innovation performance of both countries though the IUS (Innovation Union Scoreboard) report data.

4.2.1. Research and Development

Invest in intangible assets for later leverage them will bring bigger market share that will reflect into competitiveness and Portugal seems to be walking in the right direction (48% of companies are likely to say that), according to European Commission (2014). These trends tend to be smaller when it concerns enterprise added value, where 49% of Portuguese companies say that they benefit little from that when investing in intangible assets. Regarding Latvia's case, it seems that 44% of the companies don't benefit in the market share of all of their investments in intangible assets. The same trend happens when talking about enterprise added value, where three in ten Latvian´s companies don't have the benefit from investing in intangible assets (European Commission, 2014).

The indicator provided next is GERD as a percentage of GDP. This indicator encompasses "*Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications*" (Frascati Manual, 2002 edition, p. 63), according to Eurostat (2015).

Looking at the Figure 4.2, it is possible to observe that the GERD in both economies are far beyond of what is expected for 2020. Portugal is around 0.07% beyond EU-28 and Latvia around 1.07%, which means, according to Godin (2003), that the R&D intensity in Latvia is quite low.

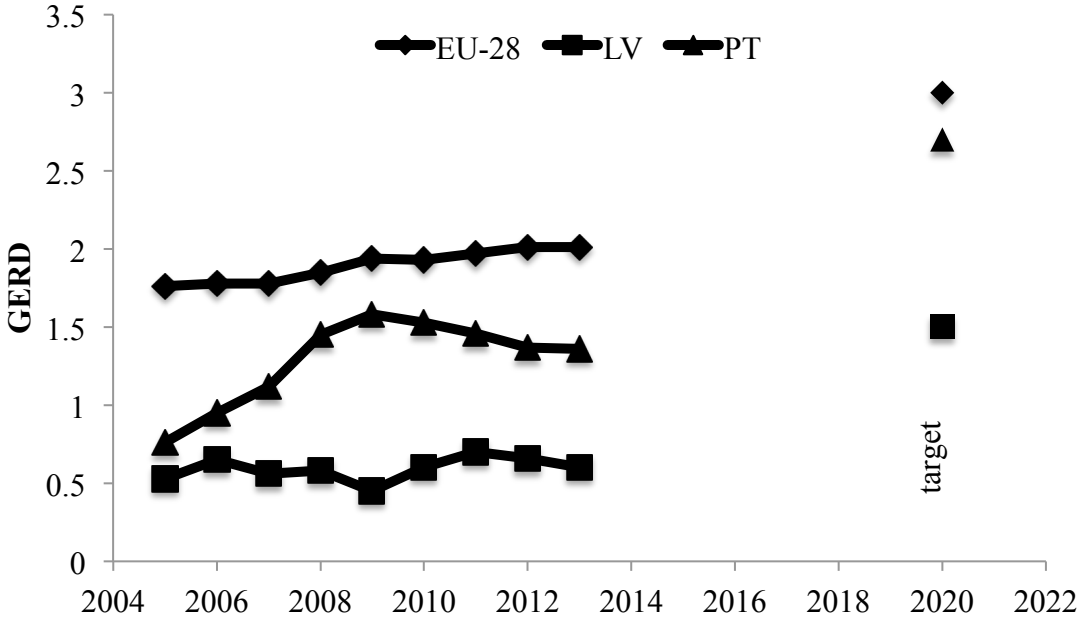

Figure 4.2 - GERD as a percentage of GDP

Source: Author's compilation; data from Eurostat, 2015

Breaking down R&D, Portugal foresees a private R&D intensity of 2% for 2015 – currently at 0,65%, and in the public sector up from 0,59% to 1%. Between 2000 and 2008, the state made significant improvements on this matter, but after the crisis, the R&D financing and budgeting fell, and hence, the strangling of the R&D intensity in which business and public dynamics were operating (Commission Staff Working Document, 2015). In 2011, Raluca compared the level of Portugal and Sweden in terms of R&D activities. After two years, Portugal had 1,36% of GDP in 2013, having as the 2020 target a total of 3% in R&D intensity. The research activities provided in Latvia are lower than expected – currently at 0,60% of GDP, far beyond of the 2020 target of 1,5% of GDP and suggestions are left by the EC in which the policies reforms should be towards productivity efficiency and innovation – strengthening the National Innovation System, extend and reinforcement of the R&D budget (Commission Staff Working Document, 2015).

4.2.2. Patents

The total European patent applications refer to requests for protection of an invention directed either directly to the European Patent Office (EPO) or filed under the Patent Cooperation Treaty and designating the EPO (Euro-PCT), regardless of whether

they are granted or not. If one application has more than one inventor, the application is divided equally among all of them and subsequently among their countries of residence, thus avoiding double counting. The data shows the total number of applications per country and then the author aggregated in two groups: EU countries and non-EU countries[12], and then weights were calculated.

The number of patent applications seems to follow the trend of GERD, as demonstrated in Table 4.2, since between 2005 and 2008 these applications were increasing and after 2008, the decline seems to be constant for the overall EU-28, compared to other countries' total. Portugal and Latvia may also follow policies driven by budget cuts mostly in vulnerable sectors such as R&D, since after crisis the number of requests for patents, either granted or not, has decreased.

Table 4.2 - Patent Applications Shares (%) in relation to non-EU countries total

	2005	2006	2007	2008	2009	2010	2011	2012
EU-28	77,06	81,45	85,43	88,48	85,41	80,96	78,19	75,29
PT	0,17	0,15	0,18	0,18	0,14	0,14	0,16	0,15
LV	0,02	0,02	0,02	0,04	0,03	0,02	0,02	0,02

Source: Author's own calculations; data from Eurostat (2015)

In Table 4.3, Portugal seems to show slightly improvements compared to EU-28 total, reaching the same value prior to crisis (0.20%). On the other hand, Latvia seems worry with other issues rather than its novelty creation, since the performance of the innovation-related indicators are not changing or evolving at a low steady-pace, reaching its maximum in 2008.

Table 4.3 - Patent Applications Shares (%) in relation to EU-28 total

	2005	2006	2007	2008	2009	2010	2011	2012
PT	0,22	0,18	0,21	0,20	0,16	0,17	0,20	0,20
LV	0,03	0,03	0,03	0,04	0,03	0,03	0,03	0,03

Source: Author's own calculations; data from Eurostat (2015)

[12] The non-EU countries refers to Turkey, Russia, South Africa, Canada, US, Mexico, Brazil, China (except Hong Kong), Hong Kong, Japan, South Korea, Taiwan, India, Singapore, Israel, Australia and New Zealand.

4.2.3. Performance

The components of innovation are not only R&D and patents, and thus, the Innovation Union Scoreboard (European Commission, 2014) presented a report where innovation is measured by 25 different indicators[13]. The IUS uses the most recent available data from Eurostat and other internationally recognized sources with data referring to 2012 for 11 indicators, 2011 for 4 indicators, 2010 for 9 indicators and 2009 for 1 indicator.

In accordance to this, Portugal and Latvia are in the top three of innovation growth between 2006 and 2013, as highlighted in Figure 4.3, where Portugal had a 3,9% of growth, while Latvia had less 0,4 per cent points.

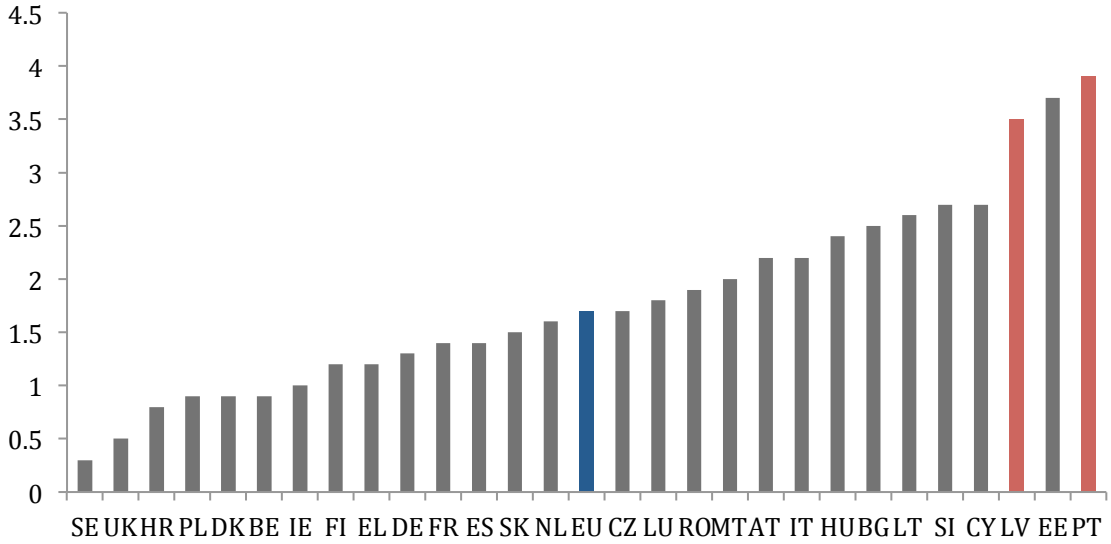

Figure 4.3 - EU member states' growth performance

Source: Author's adaptation from European Commission (2014)

The performance of the top three countries is driven by strong growth in some indicators, such as growth in international scientific co-publication, growth in non-EU doctorate students, R&D expenditures in the business sector, patent applications in general and societal challenges, which has aided Portugal but not Latvia (for several of these indicators Latvia is showing only a mediocre growth performance). For Latvia high growth in new doctorate graduate students, population with completed tertiary education aged between 30 and 34, most cited publications, SMEs introducing marketing or organizational

[13] As presented in Figure 2.3 of the Innovation section.

innovations, employment in knowledge-intensive activities and the contribution of medium and high-tech product exports to the trade balance have been the main drivers of the country's strong growth performance (European Commission, 2014).

In terms of absolute performance there is a bigger innovation performance gap between Portugal and Latvia, as shown is the Figure 4.4. Either way both focus countries had a performance below the EU average, where Portugal had a rate between 50% and 90% of this EU average being considered as a *Moderate Innovator*, while Latvia performed below 50% of the EU average being classified as a *Modest Innovator* (European Commission, 2014).

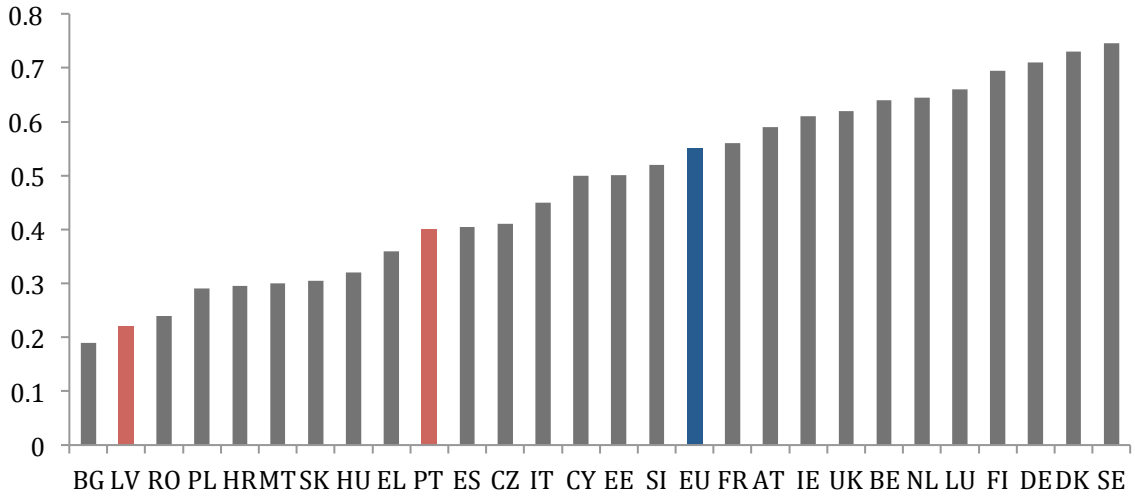

Figure 4.4 - EU member states' innovation performance

Source: Author's adaptation from European Commission (2014)

More specific, the Portuguese innovation performance has been increasing until 2010 after which it has remained relatively steady. Portugal managed to improve its performance relative to the EU from 64% in 2006 to 79% in 2010 before falling to 74% in 2013. Most indicators are growing positively in Portugal, in particular community designs, R&D expenditures in the business sector and international scientific co-publications. Large declines in growth are observed in non-R&D innovation expenditures, new doctorate graduates and venture capital investments (European Commission, 2014).

The innovation performance in Latvia has been increasing at a steady rate until 2012 but dropped in 2013, in particular due to a worsened performance in patent applications. Latvia has been improving its relative performance to the EU from 35% in

2006 to 40% in 2013. Despite the fact that Latvia performs below the average of the EU for almost all indicators, growth is increasing for a number of indicators, namely in community trademarks, new doctorate graduates, population with completed tertiary education and community designs. A large decline in growth is observed for non-R&D innovation expenditures as well as in R&D expenditures in the business sector, innovative SMEs collaborating with others and license and patent revenues from abroad (European Commission, 2014).

As mentioned in the Flash Eurobarometer – a general survey conducted to the state members of the EU and the United States (European Commission, 2014), Portugal has the highest amount of employees that were the ones responsible for the company´s innovation development (92%) compared with 75% of Portuguese companies are likely to say that it was other companies' ideas that gave them the motivation to move forward. In the case of Latvia it´s possible to know that the bigger contribution to development of ideas is from public organisations (European Commission, 2014).

4.3. International Relevance

The internationalization relevance of Portugal and Latvia is analysed and compared in relation to EU under exports, imports, net experts and foreign direct investment variables, which is how this section is structured.

4.3.1. Exports

Altomonte et al. (2013) state that exports are one of the simplest types of internationalization and, additionally, one of the most used indicators in this sort of studies (Priede & Škapars, 2011). In this case, exports of goods and services as percentage of GDP, in order to suppress the economy sizes differences, as presented in Figure 4.5.

The data is from Eurostat (2015) and this indicator represents the value of exports of goods and services divided by the GDP in current prices, between 2005 and 2014 (the most recent data available).

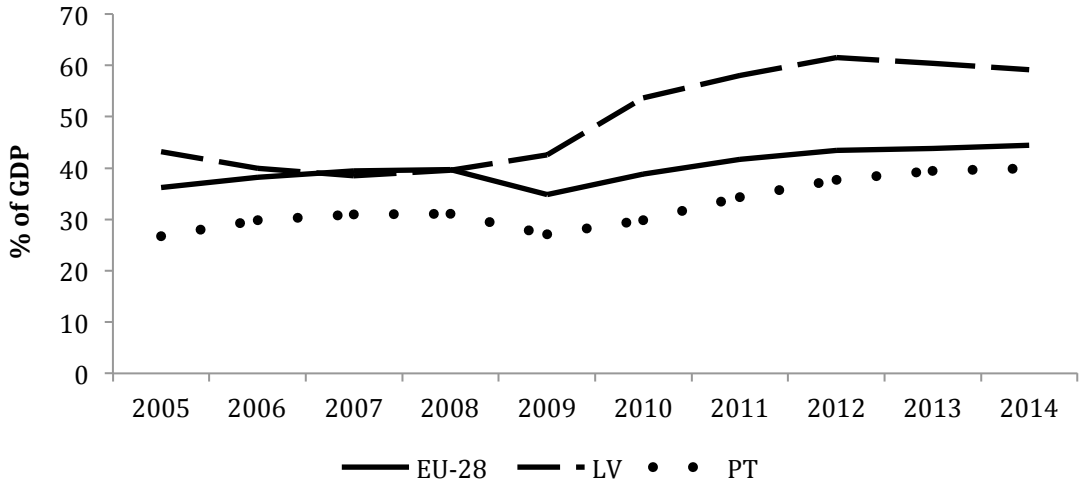

Figure 4.5 - Exports as a percentage of GDP

Source: Author's compilation; data from Eurostat (2015)

The Global Competitiveness Index (GCI – Schwab, 2014) is also clear about the position of both countries in terms of exports as a percentage of GDP where Latvia is in a high place in this indicator, ranking at the 31st position – in a sample of 144 countries, while Portugal has a performance below EU average, occupying the 66th place in the same rank of 2013, having a difference of around 20%.

Between 2010 and 2011 Latvia doubled its exportation activities from 3.5 to 7.2 billion euros, perhaps due to a several improvements on productivity efficiency. Actually, as the real labour productivity increases, the exports by volume have the same behaviour. What seems to contribute also for the growth of the Latvian exports is the added value abilities on outputs, which made the rate of exports, of gross domestic product (GDP), grew from 41.9% to 59.3%. Additionally, only in one year, between 2000 and 2011, the Latvian's GDP growth rate was lower than the EU's average (Auziņa-Emsiņa & Ozoliņa, 2014). Currently (June 2015), the absolute value of exports is 810.05 million euros, counting with a negative balance trade of -230.10 million euros.

According to Trading Economics (2015) Portugal major exports are: clothing and footwear, machinery, chemicals, cork and paper products. Additionally, the Trading Economics (2015) state that Portugal is the world's fifth-largest producer of tungsten, and the world's eighth-largest producer of wine (Port Wine, Vinho Verde and Madeira Wine) and the world's largest producer of cork. The main destinations of these goods are Spain,

Germany, France and Italy. On the third quarter, the Portuguese exportation dropped significantly, but nothing to worry about since it followed a trend of the rest of the European countries (Commission Staff Working Document, 2015)

In terms of the exports sector, Latvia is expected to have a bigger volume of imports than exports either due the depreciation of Russian Ruble – Russia represents 11% of total exports in Latvia - or the risks of external exposure that indirectly affect other trading partners. Latvia's main export partners are Lithuania, Russia, Estonia, Germany and Sweden and they import from Latvian industries mainly wood, wood products, machinery and equipment, iron and steel, textiles and foods (Commission Staff Working Document, 2015).

4.3.2. Imports

Because also imports are part of an international process (Altomonte et al., 2013), the Figure 4.6 shows the evolution of both countries' needs. Portugal seems to follow the European trend while Latvia has bigger imports performance as a percentage of its GDP. In addition, from 2006 until 2009, Latvia had a decline around 10% and at the same in Portugal between 2006 and 2008 had a slightly rise in its relative imports performance.

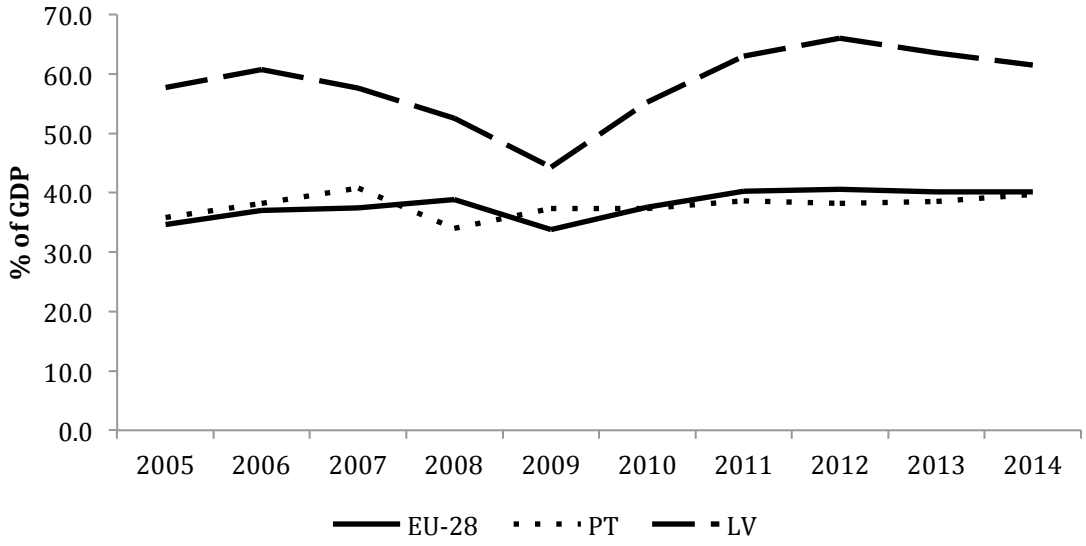

Figure 4.6 - Imports as a percentage of GDP

Source: Author's compilation; data from Eurostat, 2015

The Portuguese economy top demands are machinery and transport equipment, chemicals, petroleum, textiles and agricultural products. Most imports come from the EU countries such as Spain, Germany, France, Italy and UK. Latvia major imports are in machinery and equipment, chemicals, fuels and vehicles and the main import partners are Lithuania, Germany, Russia, Poland and Estonia (Trading Economics, 2015).

4.3.3. Net Exports

The purpose of this indicator is to expose the amount by which foreign spending on Portugal and Latvia exceeds the home country's spending on foreign goods and services, measured in percentage of GDP. In simple words, it is the value of exports minus the value of the imports, as demonstrated in Figure 4.7.

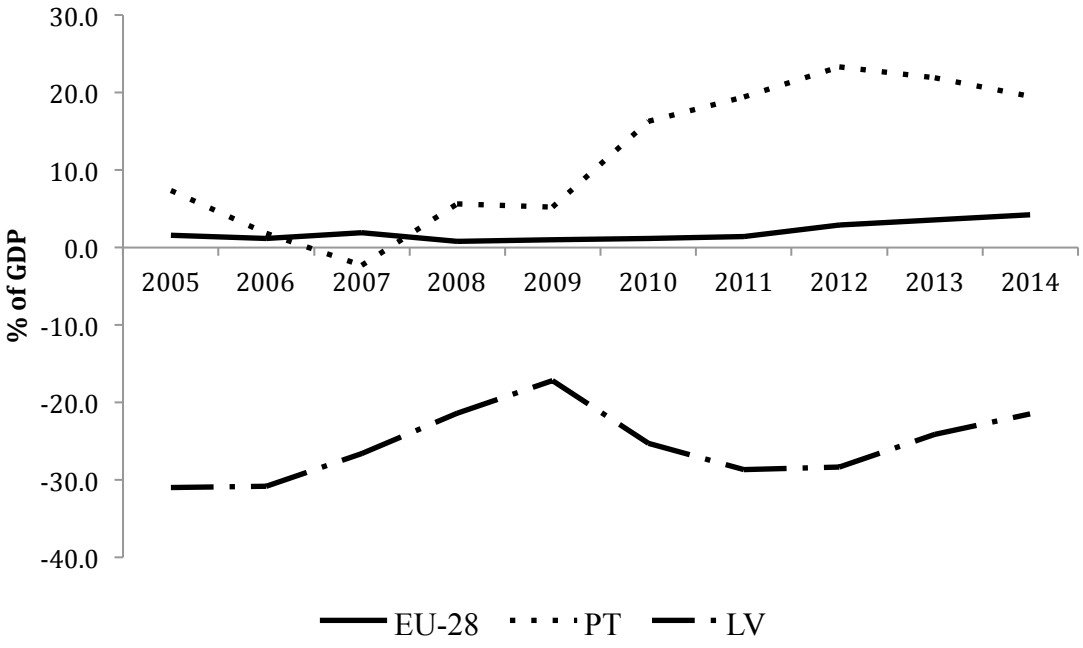

Figure 4.7 - Net exports as a percentage of GDP

Source: author's own calculation from data collected in Eurostat (2015)

As reported in the previous exports and imports' figures, despite the fact that Latvia presented higher performances in both indicators, it presents a negative value in net exports, demonstrating that the Latvian's imports of good and services are greater that its exports. Portugal, in turns, presents a positive value in net exports showing to have an

exceeding in its exports of goods and services comparatively with its imports. The case of Portugal and Latvia can show the discrepancies lived within EU, since the latter presents a net exports value near zero.

4.3.4. Foreign Direct Investment

Foreign direct investment (FDI) net inflows equals the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments, according to Trading Economics (2015). The division (weight) of the EU, Portugal and Latvia's FDI net inflows by the World's total serves the purpose to evidence the relative importance of current indicator in these economies and their evolution among 2005 and 2013 (the most recent data), measured in United States Dollar (USD). Next, the FDI net inflows, in relation to EU's total, reveal the Portuguese and Latvian contribution for the EU's attractiveness to foreign investors along the same timeline.

Moreover, the FDI indicator, in a short sentence, is able to disclosure knowledge/technology transfer, or even display the respective internationalization degree, according to Altomonte et al. (2013). Globally, European Union in 2013 held 34,58% of the FDI net inflows, according to Table 4.4, but in 2005, this share was bigger – 56,63% – that can be translated to policy-driven changes or attractiveness losses.

Table 4.4 - FDI Shares (%) in relation to World's total

	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
EU	56,63	51,32	54,44	44,56	31,81	37,03	37,37	28,89	34,58
PT	0,33	0,60	0,20	0,31	0,40	0,32	0,54	0,73	0,36
LV	0,06	0,08	0,09	0,06	0,00	0,02	0,07	0,06	0,04

Source: Author's own calculations; data from Trading Economics (2015)

In what concerns this project, in 2013, Portugal and Latvia had a tiny part of the pie – 0,36% and 0,04%, respectively. The slice is still small, if we look to the contribution into the European sphere, where Portugal holds 1,03% of the EU attractiveness whether Latvia's position doesn't move from the 0,13%. It can be noticed that the periods after crises 2008-2009 were the worsts at capturing foreign investment for Latvia. For Portugal

it was the previous year of the burst of the American financial bubble (2007) that had the lowest harvest of its European position.

Table 4.5 - FDI Shares (%) in relation to EU's total

	2005	2006	2007	2008	2009	2010	2011	2012	2013
PT	0,58	1,17	0,36	0,71	1,26	0,87	1,44	2,52	1,03
LV	0,11	0,16	0,17	0,13	-0,01	0,06	0,18	0,20	0,13

Source: Author's own calculations; data from Trading Economics (2015)

Concomitantly, if we compare directly both countries (Table 4.5) it is possible to understand that the attractiveness of the Portuguese and Latvian economy are different as already shown by their respective position in the international community. The GCI (Schwab, 2014) support the latter sentence since one of the indicators that lag's the Latvian competitiveness is the market size, which in turns is quite low attractive.

4.4. Competitiveness Achievement

"*The concept of the 'competitiveness of an economy' used by European institutions and other international institutions implies a 'significant and sustainable growth of productivity'."* (Vaz, 2012, p.1319)

In the present section it will be analysed the productivity as a signal or (lack of it) of competitiveness as well as the competitiveness performance of Portugal and Latvia compared to advanced economies. Then, it is evidenced how Portuguese and Latvian competitiveness is explained by their expenditures on R&D and patents through a linear correlation analysis. At last, the international competitiveness of both countries' firms will be measured by exports with a shift-share approach.

4.4.1. Productivity

According to Kendrick (1961) the productivity measures the resources' efficiency used in the production process and mirrored in the output – final goods or services. The productivity per person employed is intended to give an overall impression of the productivity of national economies expressed in relation to the EU-28 average. Please note

that a person employed does not distinguish between full-time and part-time employment. The input data are obtained through official transmissions of national accounts' country data in the ESA2010 transmission program, according to Eurostat (2015). Data are expressed as percentage change comparing year Y with year Y-1.

For what was said, the level of productivity per person employed can show signals of competitiveness according to Porter (1990). The differences between Portugal and Latvia seem to follow the same differences of the wealth per capita (GDP) and intensified by the expenditures on R&D (GERD), in comparison to the EU. The worst time span was between 2007 and 2009, where Latvia has performed a low level of productivity, as shown in Figure 4.8. On the other hand, the Portuguese productivity decreased only between 2007 and 2008 when in turns remained at a lower steady pace, improving it from 2009, but in 2010 it seems that it declined again. Both Portugal and Latvia are now experiencing a higher recovery by now than the EU's average rate. Additionally, through the linear trend line from 2014 (Annex III) it is possible to show that in the same period of time, Portugal had a decline in its real productivity compared to previous year. On the other hand, Latvia recovered from a decline revealed between the first 3 years and 2013, reaching the top in 2014.

Figure 4.8 - Real Labour Productivity per person employed

Note: between 2007 and 2013 data from Latvia has a break in time series; data of Portugal from 2011 and 2012 is provisional; Source: data from Eurostat (2015)

Possible strategies to improve productivity in Portugal, as reported by Vaz (2012), are to invest in skilful labour in general, except in the intensive-knowledge sectors and investment in the diffusion of skilful capabilities in non-industrial sectors. Furthermore, the efficiency of the exports' business must be higher, while the import ones must be substituted. According to Fedotovs (2010), productivity is the crucial bottleneck of the Latvian economy performance. Once seen as a country with cheap but skilful labour resources, now it's facing a huge emigration flow, putting the education system sustainability in danger, through non-driven innovation policies by the governments. Thus, the potential for high-tech and intensive-knowledge sectors, important for a competitive strategy, is highly questioned, vanishing its most precious comparative advantage. In the Portuguese case, the capital available for private sector is low, which in turns strangles the projects with the highest expected rates of return (sometimes, in favour of politically connected ones) (Schwab, 2014).

4.4.2. Achievement

The Global Competitiveness Report (Schwab, 2014) was the main support for the analysis of Portuguese and Latvian main competitive factors, along with 100 indicators aggregated in main 12 pillars of competitiveness within 3 categories (Figure 2.6).

From this report (Schwab, 2014), it is possible to observe that Portugal is an innovation driven country placed at 36th position out of 144 economies, while Latvia is in transition from an efficiency-driven economy for an innovation-driven country placed below in 42nd with only 0.04 point of difference discriminated in Table 4.6. By group, Portugal had a better classification in innovation and sophistication factors and Latvia had the worst rank level in it. The reverse happens, when we regard the worst level of Portugal that is in the basic requirements while Latvia has a better classification.

Table 4.6 - Global Position in GCI 2014-2015

	Portugal		Latvia	
	Score (1-7)	Rank (out of 144)	Score (1-7)	Rank (out of 144)
Basic requirements	5,00	41	5,14	34
Efficiency enhancers	4,57	37	4,60	36
Innovation and sophistication	4,19	31	3,68	61
GLOBAL POSITION	4,54	36	4,50	42

Source: Author's compilation; data from Schwab (2014)

The biggest differences in the performance of Portugal and Latvia are firstly in the infrastructure and macroeconomic environment, secondly in labour and financial market efficiency and then in market size, demonstrated in Figure 4.9. The drivers of the Portuguese competitiveness (following the advanced economies'[14] trends) are in its infrastructure conditions, healthy and primary education system, technological readiness capacity and market size of the economy, which encompasses both domestic and foreign markets. At the same time, what turns attractive for Latvian competitive environment are the macroeconomic conditions (even better than the advanced economies), the healthy and primary education system, the flexibility of the labour market and the efficiency of its financial structure.

[14] Switzerland, Singapore, US, Germany, Netherlands, Japan, Hong Kong SAR, Finland, Sweden, UK, Norway, Denmark, Canada, Taiwan and China, New Zealand, Belgium, Luxembourg, Australia, France, Austria, Spain, Lithuania, Portugal, Italy, Latvia, Malta, Slovenia, Cyprus, Slovak Rep. and Greece.

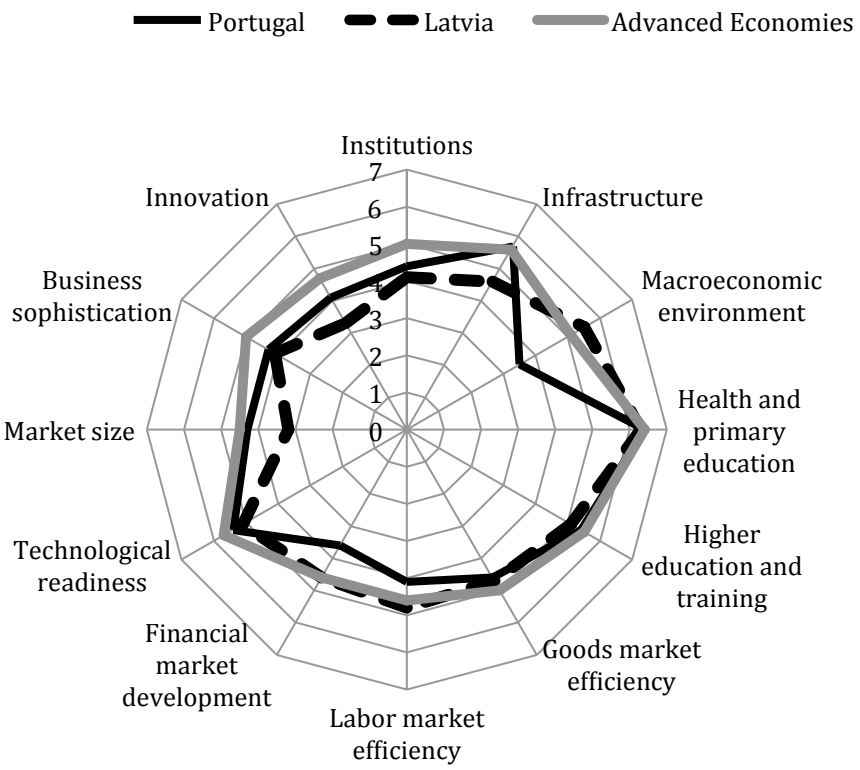

Figure 4.9 - Competitiveness Performance in 2014-2015

Source: Author's compilation; data from Schwab (2014)

One of the main concerns about Latvia, when compared to advanced economies, is the market characteristic, not only because of its small dimensions but also of the high level of competition in the bigger sectors operating in Latvia. In the same figure it's possible to understand why 40% of the Latvian companies confided that they have tons of competitors in their market (European Commission, 2014). The worst performance assessed in Portugal is connected with the stability of the macroeconomic environment, which is far behind from advanced economies, preventing the government to deliver services efficiently. The big deficit that hovers across the country restricts the government's reaction to future business cycles (Ibid).

Besides the non-warmth environment, Portugal is still able to attract investors by its position on the top of 25 countries, where it's easiest do business (World Bank, 2014). Portugal is placed at 25th among 189 economies, and in line with European recommendations, Portugal is several times cited as a country that made a lot of bureaucracy and labour reforms, despite the crisis. During 2013 and 2014, Portugal was

able to decrease the costs paid by companies, benefiting mostly small and medium enterprises. Also, enforced the labour contracts in which made easier to solve civil or commercial disputes. Last but not the least, reforms related to labour market regulation were applied, more specifically, in the cumulative duration of fixed-term contracts (World Bank, 2014). The results are a better overall performance in doing business index of 2015 where, within the final ranking, the best performance of Portugal is placed in 10th in the category of 'Starting a business' and 'Resolving insolvency'. For future policies, it should be improved the access to credit in which Portugal is located at 89th and, even though much better, the 'Paying taxes' is still placed at 64th which is not favourable for the country's attractiveness (World Bank, 2014).

According to the same institution, Latvia made during 2013 and 2014 a noteworthy change in the payments of taxes, namely in the simplified tax compliance processes. It simplified the value-added tax (VAT) return and reduce employers' social security contribution rate. This not already mentioned concerns to the fact that Latvia difficult the process of starting a business by increasing fees in registration, bank and notary procedures. Still, is ranked in 23rd in the index of Doing Business of 2015, having as a best score in the category of 'Enforcing contracts' (16th) and 'Getting credit' (23rd) within an assessment of 189 countries. For future concerns, the government should be aware and improve 'Getting electricity' located in 89th and 'Protecting minority investors' (49th) (World Bank, 2014), which can dispel the current attractiveness of the country since its business composition is 99,8% of SME's (European Commission, 2014).

4.5. Linear Correlation and Shift-share Analyses

Along with the previous statistical analysis, it is also employed a linear correlation analysis in order to assess the strength of the relation between innovation efforts and competitiveness. Then, a sectorial analysis is used to perceive to which extent Portuguese and Latvian firms are internationally competitive.

4.5.1. Innovation and International Competitiveness Correlation

The strength in which innovation and competitiveness are related is illustrated in Table 4.8, i.e. the productivity competitiveness correlated with domestic product expenditures on R&D and patent applications. All data has accepted significance, as shown in Annex IV, and the correlation coefficients presented below.

Table 4.7 - Innovation and Productivity Competitiveness

Portugal		Latvia	
Patents vs. GERD	-0,57655	Patents vs. GERD	-0,23532
GERD vs. Productivity per person employed	-0,21858	GERD vs. Productivity per person employed	0,23804
Patents vs. Productivity per person employed	-0,08083	Patents vs. Productivity per person employed	-0,6555

Source: Author's computation (output in Annex IV); data from Eurostat (2015)

There is evidence that the Portuguese productivity has a weak negative strength with GERD and patents, and the relation between the latter variables are negatively moderated. On the other hand, it seems that the Latvian productivity per person employed in positively explained by the expenditures on R&D, even though with a weak strength. Similarly to Portugal, the relationship between patents and GERD as well as amongst patents and productivity is negatively linear, at a moderate and weak point, respectively.

The international competitiveness measured by exports and explained by patents and GERD are presented in Table 4.9, as well the respective correlation coefficients. All data has accepted significance, as shown in Annex V.

Table 4.8 - Innovation and Exports' Competitiveness

Portugal		Latvia	
Patents vs. GERD	-0,57655	Patents vs. GERD	-0,23532
Patents vs. Exports	0,33235	Patents vs. Exports	-0,32039
GERD vs. Exports	0,30061	GERD vs. Exports	0,54479

Source: Author's computation (output in Annex V); data from Eurostat (2015)

The international competitiveness seems to be explained by the number of patent applications, since both (patents versus exports) has a positive linear relationship in Portugal, even though weak. The same happens to Portuguese expenditures on R&D that, despite the moderate negative relationship with patents, presents a weak positive linear

relation with Exports. In the case of Latvia, patents have a weak negative linear relationship with GERD and exports. A factor that seems to moderately explain international competitiveness of Latvia is the expenditures on R&D.

4.5.2. Sectorial Competitiveness

On top of this, it is now scrutinized which firms are more internationally competitive regarding the exports' competitiveness shift-share analysis. Latvia's export structure is around 90% constituted by fast growing sectors while Portugal has around 60% of sectors growing at a faster rate that the EU's average growth (Annex VI). Table 4.9 shows the growths that Portugal and Latvia experienced between 2005 and 2013 in each sector (exports differential), i.e. it shows if Portugal or Latvia gained or lost competitive position of exports to non-EU members in that sector in relation to European Union (EU). As explained in the methodology chapter, exports differential is a sum of the explicative effects: industry mix effect (IME), competitive effect (CE) and interactive effect (IE). Additionally, it shows the exports that would have occurred if Portugal and Latvia had behaved similarly to the EU (share effect-SE).

In accordance to this, is explicit that the Portuguese firms of Mineral fuels, lubricants and related materials strengthen their competitiveness in relation to EU mostly to its growth rates in exports to non-EU members (competitive effect-CE). In the same time period, Latvia weakened its competitive advantage in mineral fuels, lubricants and related materials mostly to its declines in the exports (shown in Figure 4.5 and 4.7), but if Latvia had the same growth rate as the EU and the same proportion of this industry in the total exports as the EU, would have plus 70,831 million euros in its trade balance (SE).

Table 4.9 - Exports' Competitiveness in relation to EU

Million EUR	SE	IME	CE	IE	Exp. Diff.
Mineral fuels, lubricants and related materials					
PT	447,456	527,430	844,115	456,680	1828,225
LV	70,831	84,150	-113,982	-61,889	-91,720
Food, drinks and tobacco					
PT	309,465	189,413	506,121	192,163	887,698
LV	48,988	105,305	696,708	45,543	847,555
Machinery and transport equipment					
PT	1381,183	-278,885	-23,298	5,894	-296,288
LV	218,638	-131,575	589,937	-137,727	320,635
Other manufactured goods					
PT	696,556	226,300	2079,144	509,841	2815,285
LV	110,263	51,609	430,127	24,574	506,311
Chemicals and related products					
PT	639,949	-378,588	351,639	-509,360	-536,309
LV	101,303	-29,111	163,808	-24,354	110,343
Raw materials					
PT	127,411	133,175	246,414	125,932	505,521
LV	20,169	60,861	200,970	16,789	278,620

Source: Author's own calculations in Annex VI; data from Eurostat (2015)

In the industry of food, drinks and tobacco both countries had a similar competitive performance mostly to the firms' openness to operate abroad, but Portugal could have benefited of 309,465 million euros in its exports if had the same growth rate and proportion in its total exports of this industry as had the EU between 2005 and 2013 (SE). Latvia, on its side, shows in this sector the biggest export differential mostly due to the growth rates that the food, drinks and tobacco sector performed in the Latvian market, higher than in the EU market. Also, the results of its interactive effect explicitly show that Latvia is more specialized in the food, drinks and tobacco sector.

At the same time, Portugal seems to have lost competitive advantage in two sectors: machinery and transport equipment and chemicals and related products. In the first sector, the differential is mainly due to the negative effect of industry mix (IME), i.e. slow growing firms dominate the Portuguese sector of machinery and transport equipment and one of the reasons can be the catch up phenomena from the CEE countries when they became EU's member state right before of this timeline (Igan, Fabrizio, & Mody, 2007). It could have 1381 million euros if this industry represented the same for Portugal as in the

EU and had grown at the same rate (SE). In the latter industry, the deterioration of the competitive position was mostly caused by the negative interactive effect (IE), i.e. the economic structure and competitiveness interaction results in a non-specialized country in chemicals and related products.

It is in the machinery and transport equipment that Latvia could benefited the most – 218,638 million euros – if it was a tiny EU. Still, the fact of being a member state of the EU influenced positively the Latvian firms within this sector. The same happens to the rest of the sectors, where Latvia benefits the most from its competitive effect, i.e. experienced higher growth rates than the EU itself.

To what concerns the other manufactured goods sector, it has performed the biggest exports differential of Portugal, mostly due to its growth rates during 2005 and 2013. Additionally, is in this vary same sector that the interactive effect of Portugal is higher, i.e. Portugal seems to be more specialized in other manufactured goods. On the other hand, Latvia shows less potential in the sector of raw materials, which can be explained by the long history that this country demonstrates in operating in the raw materials market (Priede & Skapars, 2011).

5. Conclusions and Further Research

The final chapter is built to provide firstly, a summary of the main findings from the previous analyses and secondly, final reflections of the present work and further research.

5.1. Summary of the Main Results and Issues

Innovation

Despite the high growth performance that Portugal and Latvia experienced between 2006 and 2013 in terms of innovation performance (Figure 4.4), it is evident the need to improve the real productivity (Figure 4.8) to sustain a boost for the innovation activities towards economic growth. In the basis of the innovation process – R&D – Latvia is far beyond of what EU is expecting (Chart 4.2), as well as in Portugal, even though to a lower extent.

The R&D intensity is higher in Portugal when compared to Latvia and thus, a shift in the Latvian government policies should have happen as soon as possible, namely strengthening the National Innovation System (NIS), extend and reinforcement of the R&D budget (Commission Staff Working Document, 2015). In accordance to this, is the patent data of Portugal and Latvia that doesn't show much evidence of the weighted relevance in the EU-28 total, emphasizing the need of such policies' changes.

Additionally, understand the productivity determinants, approach specific industry and focus on its segments, are the recommendations left 15 years ago by an American author that seems to fit to the current position of Portugal and Latvia. Of course, it is only possible with the state support in creating a favourable in-house business environment in order to preserve and sustain its core operations, which are underpinned to a strategic international competitive position (Porter, 1990).

Having in mind the work so far and certain that innovation leads into a stronger competitive position by the European firms, it must be said that the priority of EU should be increasing the investment in R&D and, consequently, in innovation field (Priede & Pereira, 2013). Profitability shouldn't be part of the final goal has Nelson argued (cited by Simões, 2008).

Internationalization

Despite of the relative good economic conditions demonstrated by the GCI, the data from the international trade (exports, imports and net exports) is explicitly about the volatility of economic environment of Latvia, since it demonstrates higher performances in recovery times but at the same time huge declines when the crisis hit the Europe, which can be explained by the "acceleration principle" developed by Mensch (1979) based on the current "pessimist mood" referred by Freeman (1982). Portugal, according to the same international data, seems a less risky environment, but still vulnerable and with lots of reforms to execute.

In one hand, the share of exports in Portugal is characterized by low-tech sectors translated in the non-significant innovation intensity, as a specific-country feature. (Faria & Sofka, 2010). On the other hand, the scientific time span difference amongst the works of Davidsons (2005) and Karo (2011) can be used to consolidate either the argument that the frame of Latvian exports and current situation hasn't changed as well as the state efforts to overcome these negative effects of the current policies, evidenced by the negative value of net exports (Figure 4.7). The recommendations made by Davidsons (2005) rely on the Latvian potential, based on exports-related processes and skilful-related production rather than the intensive-land dynamics, currently used.

To what concerns the foreign attractiveness of the EU, Portugal and Latvia has no word in it since they only represent together 1,16% of the total FDI inflows in the EU. The main reasons pointed out are concerned to the market size, mostly in Latvia (Schwab, 2014). There are some factors that can clear the readers about the attractiveness (or not) of Portugal and Latvia to foreign investors such as getting credit (World Bank, 2014). This latter factor contributes to the non-attractiveness of Portugal since is placed at 64th among 189 countries, while in Latvia seems easy get credit (23rd), being a positive factor to whom is interested in invest in Latvia. If investors desire to start a business in Portugal it's guaranteed that is easy, according to the report of Doing Business 2015 – being in the top 10. For the ones interested in Latvia it seems that getting electricity is not that easy (89th), as the matter of fact Latvia is not good also in protecting the minority investors (49th), which is bad if we have in consideration that the Latvian business structure is based on 99,8% of SMEs (European Commission, 2014).

Competitiveness

About competitiveness analysis of Portugal and Latvia, the real productivity per person employed remains relatively low, mainly due to the prevalence of low-tech and medium-low-tech industries in both countries (about Portugal: Vaz, 2012; about Latvia: Fedotovs, 2010).

According to Schwab (2014) the biggest differences in the competitiveness performance of Portugal and Latvia are firstly in the infrastructure and macroeconomic environment, secondly in labour and financial market efficiency, market size and innovation (Figure 4.9). Latvia has higher competitiveness when compared to Portugal by its favourable macroeconomic conditions and by its financial market development (evidenced also in the Doing Business report of the World Bank, 2014). On the other hand, Portugal gains to Latvia in terms of market size and innovation performance (demonstrated previously by R&D intensity and patents as well as in the IUS report - European Commission, 2014)

Innovation and International Competitiveness

The productivity competitiveness in Portugal is neither positively related to innovation (patents and GERD) but in Latvia the expenditures on R&D seem to positively explain productivity. If we look to international competitiveness of Portugal by the exports, the patent applications seems to have a word in it, likewise the R&D expenditures. Latvian international competitiveness is positively explained by the GERD, emphasizing the relevance of government's policy in R&D budgeting.

The exports to EU member' states and to other non-EU countries seem to have influence in the industry competitiveness of Portugal. Albeit the machinery and chemicals sectors are part of the major exports of Portugal, the shift-share analysis shows that Portugal is not specialized in this kind of industries (Table 4.9). The main support of this is due to the major exports destinations are within the EU (Spain, Germany, France and Italy) but when looking for Extra-EU exports, both sectors play a negative role in the Portuguese structure.

Still, Portugal seems to have a competitive advantage in other manufactured goods and Latvia is specialized in food, drinks and tobacco exports to countries outside of the EU (Table 4.9). This trend is supported by the relative growth of fast growing industries in

both countries, precisely 90% and 60%, respectively (Annex V). Both economies demonstrates have a great exports' potential in the machinery and transport equipment to countries outside of the EU, since Germany is the major player of this industry (Eurostat, 2015).

5.2. Final Considerations

This work is an attempt to evidence the relation between innovation and international competitiveness as well as to study empirically this relation within the Portuguese and Latvian performances.

The performance of overall indicators got worse after the crisis showing by now a recovery, even though at a lower steady pace. At the same time, Portugal should not be complacent and should continue with the full implementation of its reform program in order to keep addressing some of its persistent macroeconomic concerns (caused by high levels of deficit and public debt). The recommendations for Latvia remains in the lack of innovation support policies and market size relevance for its competitiveness (Schwab, 2014).

Porter (1990, p. 73) states "*A nation's competitiveness depends on the capacity of its industry to innovate and upgrade*". If Portugal and Latvia are considered low-moderate innovators among European Union members (European Commission, 2014), it is assumed that both countries have non-significant competitive position within European market. It is urgent then, increase the budget on R&D in order to Portugal and Latvia continues their improvement process in the innovation performance and consequently, became in innovation leaders. Higher incentives lead the business invests in innovation and thus more competitive becomes as well as its home region since both innovation and competitiveness walk side-by-side (Roper & Love, 2002; Igan, Fabrizio, & Mody, 2007; Filippetti, Frenz, & Ietto-Gillies, 2011; Filippetti & Archibugi, 2011), evidenced also in this work. For Portugal, innovation at expenditures on R&D and patents level are related to international competitiveness and for Latvia, only innovation connected with expenditures on R&D describe its international competitive position.

Altomonte et al. (2013, p.671) state "*internationalized firms seem to belong to a more selective club than innovative firms"*. It seems that nowadays, the rule is to be

innovative in order to survive, but if companies want to stand up from its competitors, they need to evolve to international level. The benefits that the innovative countries will reap are, in a short term, a positive trade balance, and in a long term an improvement in the trade flows as well as get specialized in the industries with higher returns (Archibugi & Michie, 1998). Portuguese companies are specialized in other manufactured goods and the Latvian ones in food, drinks and tobacco. The machinery and transport equipment to non-EU countries is the sector through which both countries can reap higher returns since they show an international competitiveness potential.

In the innovation field, a valuable data would be to know or to find out (by survey) which intangible assets are the Portuguese and Latvian companies using and then analyse them in order to get a specific profile afterwards comparing with the ones that the most competitive countries are using, reaching into several recommendations and insights.

Additionally, further research in the internationalization of the National Innovation Systems seems interesting, namely the Portuguese and Latvian one, since it has a fewer literature focusing on this matter and at the same time an "*evidence that national innovation systems themselves are becoming internationalized, even if the institutions that support them remain country-specific*", according to Carlsson (2006, p.64).

Portugal and Latvia were not compared before on scientific related papers and thus, this dissertation is assumed as an exploratory work which remains the need of further research of such themes and analysis. After the awareness of the community of such need (by this work), specific models/analysis should be applied to measure, evaluate or predict the subject under study.

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Annexes

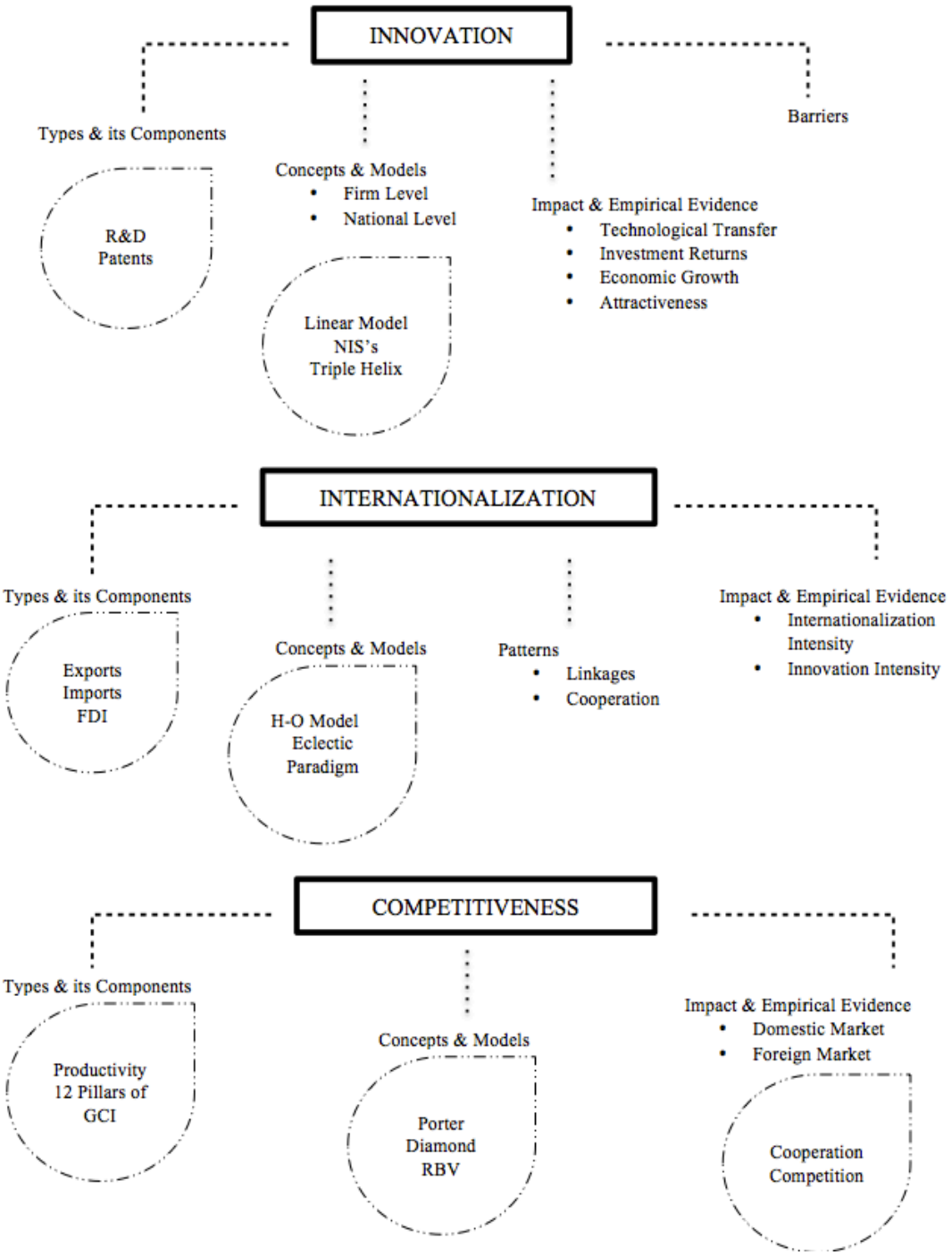
I

Methodologies used in related-field works

Author(s)	Year	Variable	Object of Study	Methodology
Paul & Welfens	1987	Exports shares; Income; Productivity; technology	Links between innovation, international competitiveness and growth in the world economy.	Statistical analysis
Herschede	1991	Exports	Assessment of the extent of Asian competition.	shift-share analysis.
Wilson & Hsien	1998	Exports	Assessing Singapore's Export Competitiveness	Shift-Share Analysis.
Blomström	2000	Wages; R&D; FDI	Examines the internationalisation of Swedish firms.	Statistical analysis
Priede	2010	Exports	Quality competitiveness in Latvia's main economic sectors.	Statistical analysis;
Nachum, Jones, & Dunning	2011	Output; Exports; FDI	Measure the relationships between the international competitiveness of the UK and its MNEs.	Statistical analysis;
Priede & Škapars	2011	Exports; Imports	The unit value of exports in the case of Latvia.	Statistical analysis
Raluca,	2011	GERD; R&D; Others	Assessment of the degree of innovation in the EU.	Qualitative method; Statistical analysis
Pereira, Bento, & Priede	2013	Exports; R&D	The contribution of technological innovation change on the exports of four EU countries.	Exploratory analysis; Comparative and descriptive analysis
Priede & Pereira	2013	R&D; Patents; Exports; FDI	Relate the export performance of a country with its R&D behavior.	Statistical analysis

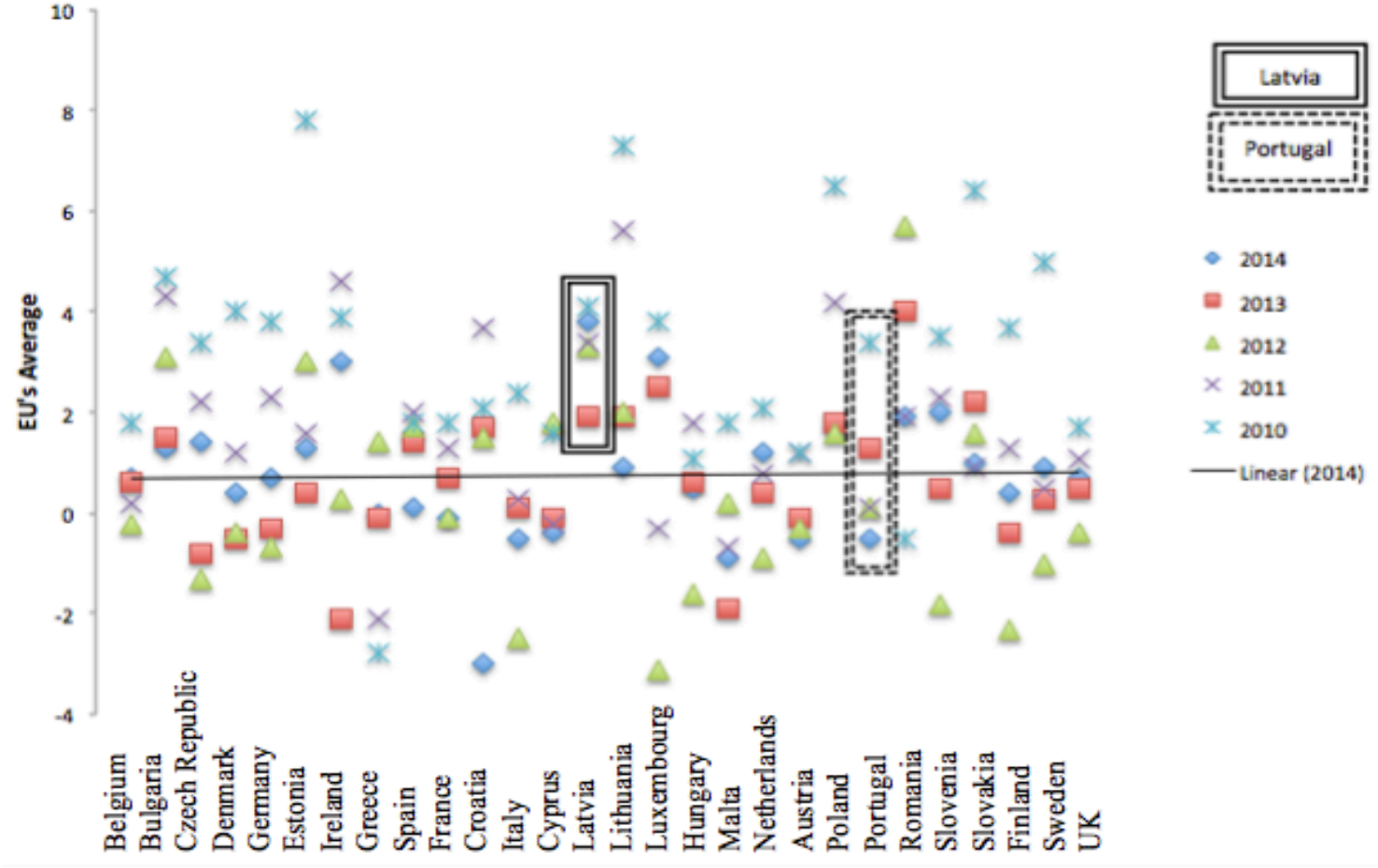
II

Explanatory framework based on scientific literature



III

Productivity per person employed



IV

Pearson Linear Correlation Output – Productivity

CORR_MATRIX_Portugal		**Productivity per person employed**	**GERD %GDP**	**Patents**
Productivity per person employed	**R**	**1,**		
	R_STDERR			
	t			
	DS_LEV			
	H0 (5%)			
GERD %GDP	**R**	**-0,21858**	**1,**	
	R_STDERR	0,13603		
	t	-0,59265		
	DS_LEV	0,57506		
	H0 (5%)	*ACCEPTED*		
Patents	**R**	**-0,08083**	**-0,57655**	**1,**
	R_STDERR	0,16558	0,11126	
	t	-0,19864	-1,72846	
	DS_LEV	0,8491	0,13464	
	H0 (5%)	*ACCEPTED*	*ACCEPTED*	

sta.series vs. sta.series	***R***	*sta.bst.nocases*
Patents vs. GERD %GDP	-0,57655	8
GERD %GDP vs. Productivity per person employed	-0,21858	9
Patents vs. Productivity per person employed	-0,08083	8

CORR_MATRIX_Latvia		Productivity per person employed	GERD %GDP	Patents
Productivity per person employed	**R**	**1,**		
	R_STDERR			
	t			
	DS_LEV			
	H0 (5%)			
GERD %GDP	**R**	**0,23804**	**1,**	
	R_STDERR	0,13476		
	t	0,64842		
	DS_LEV	0,54072		
	H0 (5%)	*ACCEPTED*		
Patents	**R**	**-0,6555**	**-0,23532**	**1,**
	R_STDERR	0,09505	0,15744	
	t	-2,12614	-0,59308	
	DS_LEV	0,07762	0,57479	
	H0 (5%)	*ACCEPTED*	*ACCEPTED*	

sta.series vs. sta.series	***R***	*sta.bst.nocases*
Patents vs. Productivity per person employed	-0,6555	8
GERD %GDP vs. Productivity per person employed	0,23804	9
Patents vs. GERD %GDP	-0,23532	8

V

Pearson Linear Correlation analysis output – Exports

CORR_MATRIX_Portugal		**Exports %GDP**	**GERD %GDP**	**Patents**
Exports %GDP	**R**	**1,**		
	R_STDERR			
	t			
	DS_LEV			
	H0 (5%)			
GERD %GDP	**R**	**0,30061**	**1,**	
	R_STDERR	0,12995		
	t	0,83391		
	DS_LEV	0,43627		
	H0 (5%)	*ACCEPTED*		
Patents	**R**	**0,33235**	**-0,57655**	**1,**
	R_STDERR	0,14826	0,11126	
	t	0,86314	-1,72846	
	DS_LEV	0,42122	0,13464	
	H0 (5%)	*ACCEPTED*	*ACCEPTED*	

sta.series vs. sta.series	***R***	*sta.bst.nocases*
Patents vs. GERD %GDP	-0,57655	8
Patents vs. Exports %GDP	0,33235	8
GERD %GDP vs. Exports %GDP	0,30061	9

CORR_MATRIX_Latvia		Exports %GDP	GERD %GDP	Patents
Exports %GDP	**R**	**1,**		
	R_STDERR			
	t			
	DS_LEV			
	H0 (5%)			
GERD %GDP	**R**	**0,54479**	**1,**	
	R_STDERR	0,10046		
	t	1,71885		
	DS_LEV	0,13644		
	H0 (5%)	*ACCEPTED*		
Patents	**R**	**-0,32039**	**-0,23532**	**1,**
	R_STDERR	0,14956	0,15744	
	t	-0,82845	-0,59308	
	DS_LEV	0,43912	0,57479	
	H0 (5%)	*ACCEPTED*	*ACCEPTED*	

sta.series vs. sta.series	***R***	*sta.bst.nocases*
GERD %GDP vs. Exports %GDP	0,54479	9
Patents vs. Exports %GDP	-0,32039	8
Patents vs. GERD %GDP	-0,23532	8

VI

Shift-share analysis output

EXTRA-EU28 Exports of Portugal in Million EUR	SITC	2005	% of Total	2013	% of Total	Abs. Change	% Change	Relative Growth*
Total		6134	100,00	14032	100,00	7898	128,76	
Mineral fuels, lubricants and related materials	(3)	585	9,54	2404	17,13	1819	310,94	Fast
Food, drinks and tobacco	(0+1)	485	7,91	1490	10,62	1005	207,22	Fast
Machinery and transport equipment	(7)	2203	35,91	3282	23,39	1079	48,98	Slow
Other manufactured goods	(6+8)	2041	33,27	5043	35,94	3002	147,08	Fast
Chemicals and related products	(5)	391	6,37	1004	7,16	613	156,78	Fast
Raw materials	(2+4)	283	4,61	790	5,63	507	179,15	Fast
Not Classified	Total-Sum	146	2,38	19	0,14	-127	-86,99	Slow
			Proportion of Fast Growing industries					61,71%
			Proportion of Slow Growing industries					38,29%

EXTRA-EU28 Exports of Latvia in Million EUR	SITC	2005	% of Total	2013	% of total	Abs. Change	% Change	Relative Growth*
Total		971	100,00	3657	100,00	2686	276,62	
Mineral fuels, lubricants and related materials	(3)	93	9,58	134	3,66	41	44,09	Slow
Food, drinks and tobacco	(0+1)	150	15,45	1001	27,37	851	567,33	Fast
Machinery and transport equipment	(7)	174	17,92	851	23,27	677	389,08	Fast
Other manufactured goods	(6+8)	358	36,87	950	25,98	592	165,36	Fast
Chemicals and related products	(5)	108	11,12	344	9,41	236	218,52	Fast

Raw materials	(2+4)	88	9,06	370	10,12	282	320,45	Fast
Not Classified	Total-Sum	0	0,00	7	0,19	7	#N/A	#N/A
							Proportion of Fast Growing industries	90,42%
							Proportion of Slow Growing industries	9,58%

EXTRA-EU28 EXPORTS of EU in Million EUR	**SITC**	**2005**	**% of Total**	**2013**	**% of Total**	**Abs. Change**	**% Change**	**Ave. Growth**	**Relative Growth***
Total		1049477	100,00	1736577	100,00	687100	65,47		
Mineral fuels, lubricants and related materials	(3)	45939	4,38	122495	7,05%	76556	166,65		Fast
Food, drinks and tobacco	(0+1)	51474	4,90	104421	6,01%	52947	102,86		Slow
Machinery and transport equipment	(7)	472276	45,00	708585	40,80%	236309	50,04		Slow
Other manufactured goods	(6+8)	263569	25,11	382744	22,04%	119175	45,22	110,01%	Slow
Chemicals and related products	(5)	163799	15,61	273289	15,74%	109490	66,84		Slow
Raw materials	(2+4)	23674	2,26	45473	2,62%	21799	92,08		Slow
Not Classified	Total-Sum	28746	2,74	99570	5,73%	70824	246,38		Fast
							Proportion of Fast Growing industries		7,12%
							Proportion of Slow Growing industries		92,88%

***If the sector growth is higher than the average growth of the EU is fast growing. If the sector growth rate is lower than the EU's average growth is slow, according to Herschede (1991).**